

THE LEADER IN SHORTWAVE AND SCANNER COMMUNICATIONS

Volume 20, No. 3

March 2001

U.S. \$4.25

Can. \$6.50

Printed in the
United States



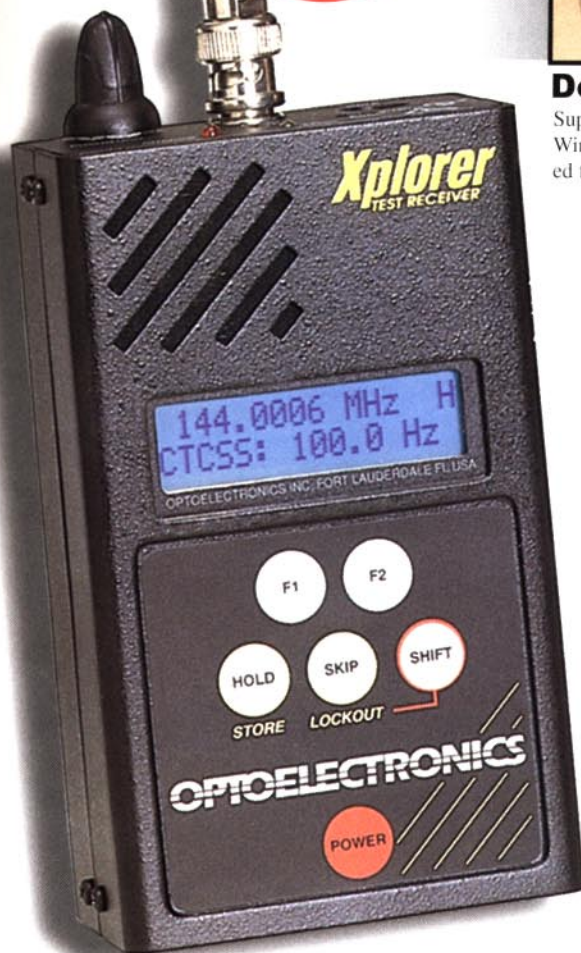
Monitoring Times

How to tune in Europe
and get those QSLs!

Scanning Central Florida: The I-4 Corridor



**NEW
FEATURE
Frequency
Blocks**



Download

Supported by Radio Manager for Windows for downloading recorded frequencies to a computer

sale **\$799**
SAVE \$100



APS105

The New APS105 Pre Selector can be interfaced to increase the Xplorer's sensitivity up to 10x.

Downloading to a PC is easy, just interface to a computer with the supplied PC download cable and all recorded data is saved for future reference














Radio Checks

The Xplorer is ideal for radio quick checks. Just key the radio and the Xplorer instantly displays the frequency, and either CTCSS, DCS, LTR, DTMF, Signal Strength, or Deviation.



EXPLORE THIS !!!

-  30MHz - 2GHz Nearfield Test Receiver*, sweeps entire range in less than 1 second
-  Lock out up to 1000 individual frequencies
-  Frequency Blocks allows the user to preselect up to ten different frequency ranges to Lock In/Out
-  Two line character LCD displays frequency and either CTCSS, DCS, LTR, DTMF, Signal Strength, or Deviation
-  Automatically record up to 500 frequencies in memory with number of hits and time and date
-  Internal speaker, Audio earphone/headphone jack
-  Built-in PC interface for downloading memories to a computer
-  800 feet pick up distance from 5 watt UHF radio
-  Manually record CTCSS, DCS, LTR, DTMF, Signal Strength, and Deviation to memory
-  Locks onto strong signals in less than 1 second
-  Automatic or manual hold

OPTODIRECT 800-327-5912
OPTOELECTRONICS®

5821 Northeast 14th Avenue • Ft. Lauderdale, FL • 33334
Telephone 954-771-2050 Fax 954-771-2052 Email sales@optoelectronics.com
www.optoelectronics.com

*Cellular frequencies blocked except for FCC approved users



*Xplorer Test Receiver includes:
TA100S, PC download cable,
Download software, Power Supply,
Operators Manual*

Connect this to your scanner...



...and be amazed!

The AX-31B antenna is a compact VHF/UHF directional antenna with a built-in amplifier, which provides a low-cost alternative to conventional VHF/UHF antennas, especially for indoor use.

This log-periodic antenna is constructed on a high-quality fibreglass substrate, with a 20dB amplifier directly mounted on the substrate, together with other surface-mount circuitry and a standard 9V PP3 type battery holder. A power switch is provided directly on the antenna.

The antenna is ideally suited for reception of VHF/UHF point-to-point communication, where its directional characteristics can significantly improve reception, and rejection of interfering signals.

The antenna covers a frequency range of 230 to 1400 MHz (a much wider frequency range can be received with reduced gain) and is ideally suited for surveillance and monitoring, EMC pre-testing and other professional and amateur applications.

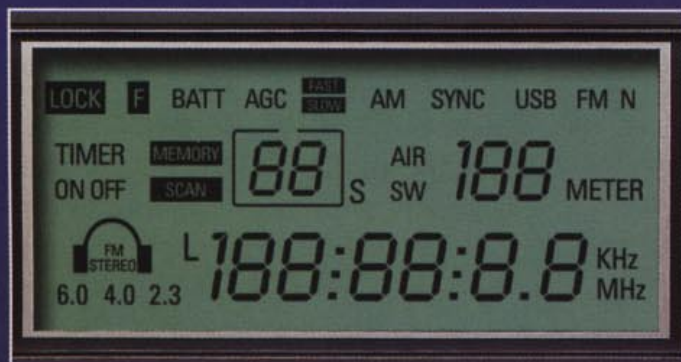
The antenna is designed for indoor reception. Its small footprint, (the size of a 11.5" by 8.5" sheet of paper) conserves space and makes concealed installation possible.

sales@winradio.com

Please visit our website to view other innovative WinRADIO products:

www.winradio.com

GRUNDIG The Ultimate in



The LCD

Big! Bold! Brightly Illuminated 6" by 3 1/2". Liquid Crystal Display shows all important data: Frequency, Meter band, Memory position, Time, LSB/USB, Synchronous Detector and more.

The Signal Strength Meter

Elegant in its traditional Analog design, like the gauges in the world's finest sports cars. Large. Well Lit. Easy to read.



The Frequency Coverage

Longwave, AM and shortwave: continuous 100-30,000 KHz. FM: 87-108 MHz VHF Aircraft Band: 118-137 MHz.

The Tuning Controls

- For the traditionalist: a smooth, precise tuning knob, produces no audio muting during use.



Ultra fine-tuning of 50Hz on LSB/USB, 100Hz in SW, AM and Aircraft Band and 20 KHz in FM.

- For Fixed-step Tuning: Big, responsive Up/Down tuning buttons.
- For direct frequency entry: a responsive, intuitive numeric keypad.



THESE ARE THE SATELLIT 800 MILLENNIUM'S MAJOR FEATURES.
FOR A DETAILED SPECIFICATION SHEET, CONTACT GRUNDIG.

Digital Technology



The Operational Controls

Knobs where you want them; Buttons where they make sense. The best combination of traditional and high-tech controls.



The Sound

Legendary Grundig Audio Fidelity with separate bass and treble controls, big sound from its powerful speaker and FM-stereo with the included high quality headphones.



The Technology

Today's latest engineering:

- Dual conversion superheterodyne circuitry.
- PLL synthesized tuner.

The Many Features

- 70 user-programmable memories.
- Two, 24 hour format clocks.
- Two ON/OFF sleep timers.
- Massive, built-in telescopic antenna.
- Connectors for external antennas – SW, AM, FM and VHF Aircraft Band.
- Line-out, headphone and external speaker jacks.

The Power Supply

A 110V AC adapter is included for North America (a 220V AC adapter is available upon request). Also operates on 6 size D batteries. (not included)



Dimensions: 20.5" L X 9" H X 8" W

Weight: 14.50 lbs.

by **GRUNDIG**

Monitoring Times

Vol. 20, No. 3

March 2001



On our Cover

Scanning Central Florida

By John Mayson

Interstate 4 crosses Florida's mid-section from the Atlantic to the Gulf, and passes right by some of the state's largest tourist attractions. In this road trip, the author is in no hurry; he wanders down to the beaches, stops in to say hi to Mickey, and ends his meandering trying to avoid a traffic jam in St. Petersburg. Lucky he brought his scanner along and put together this great list of public safety frequencies from Volusia to Pinellas counties. Don't forget to bring this article along with you on *your* next trip down I-4. Story starts on page 20.

Cover photo of Ormond Beach and Holcomb Castle by Harry Baughn.

The Key to the ENIGMA Cipher 10

By John Maky

Radio buffs who have made it their specialty to listen to, log and categorize those mysterious "counting" or "numbers" stations heard on shortwave have invented a helpful shorthand to identify these signals. Called the ENIGMA code after the European group who created them, these abbreviations are now being used in *MT's Utility World Logs*. Here is a quick initiation into their meaning.

Listening In On Europe 12

By Dave White

"In the world of shortwave listening, those who thrive on chasing DX have Africa, Latin America, and Asia. Those who enjoy a constant supply of informative, entertaining program content have Europe," says the author. Europe provides not only some of the easiest listening, but also some of the best.

The Idiosyncrasies of QSLing Europe 16

By Gayle Van Horn

Even though many of the largest and oldest shortwave stations broadcast from Europe, getting a true verification of your reception may not be any easier than getting one from a Third World country. Here are all the addresses you'll need to test it out for yourself!



MONITORING TIMES
(ISSN: 0889-5341;
Publishers Mail
Agreement #1253492)
is published monthly by
Grove Enterprises, Inc.,
Brasstown, North
Carolina, USA.

Copyright © 2001 Grove Enterprises, Inc.
Periodicals postage paid at Brasstown, NC,
and additional mailing offices. Short excerpts
may be reprinted with appropriate credit.
Complete articles may not be reproduced
without permission.

Address: P.O. Box 98,
7540 Highway 64 West,
Brasstown, NC 28902-
0098
Telephone: (828) 837-9200
Fax: (828) 837-2216 (24 hours)
Internet Address: www.grove-ent.com or
e-mail: mt@grove-ent.com
Editorial e-mail: mteditor@grove-ent.com
Subscriptions: order@grove-ent.com

Subscription Rates: \$25.95 in US; \$38.50
Canada; and \$57.50 foreign elsewhere, US
funds. Label indicates last issue of subscrip-
tion. **See page 90 for subscription information.**

Postmaster:
Send address changes to *Monitoring Times*,
P.O. Box 98, Brasstown, NC 28902-0098.

Disclaimer:
While *Monitoring Times* makes an effort to
ensure the information it publishes is accu-
rate, it cannot be held liable for the contents.
The reader assumes any risk for performing
modification or construction projects pub-
lished in *Monitoring Times*. Opinion or
conclusions expressed are not necessarily the
view of *Monitoring Times* or Grove Enter-
prises. Unsolicited manuscripts are accepted.
SASE if material is to be returned.

Owners

Bob and Judy Grove
judy@grove-ent.com

Publisher

Bob Grove, W8JHD
bgrove@grove-ent.com

Managing Editor

Rachel Baughn, KE4OPD
mteditor@grove-ent.com

Assistant Editor

Larry Van Horn, N5FPW

Art Director

Bill Grove

Advertising Svcs.

Beth Leinbach
(828) 389-4007
beth@grove-ent.com

Reviews:

Parnass gives the new *Uniden BC780XLT Trunk Tracker III* "top dog" status among trunking scanners (p.84).

Bob Grove finds an aid for aging ears in the *MFJ-616 Speech Intelligibility Enhancer* (p.87).

Catalano becomes "Radio Commander" as he finds an ingenious application for inexpensive *game software* (p. 80).

"Easy access" to the airwaves certainly defines the new *Icom IC-718* HF receiver – "lots of fun at reasonable cost" says Elliott (p.74).

For years Henry Kloss has been constructing AM/FM radios to make listening a pleasure. With his new *Kloss Model One*, he believes he got it right. He did, says reviewer Ken Reitz (p.82).

TABLE OF CONTENTS

Departments:

Washington Whispers	6
<i>Low Power FM Radio Crippled</i>	
Letters	7
Communications	8
Stock Exchange	90
Advertisers Index	90
Department Staff	90
Closing Comments	92
<i>In Tribute</i>	

First Departments

Getting Started

Beginners Corner	24
<i>Wireless Whole House Audio</i>	
Ask Bob	26
Bright Ideas	27
Scanning Report	28
<i>Michigan Monitoring</i>	
Service Search	30
<i>U.S. NOAA Weather Radio</i>	
Utility World	32
<i>US Air Force Global HF System</i>	
Utility Logs	34
Digital Digest	35
<i>HF Fax Facts</i>	
Global Forum	36
<i>WWFV Licensed to Broadcast Radioteletype</i>	
Broadcast Logs	39
The QSL Report	40
<i>European Websites</i>	
Programming Spotlight	41
<i>Can Youth Be Served?</i>	

Listening Guide

English Language SW Guide	42
MT Satellite Service Guide	62

Second Departments

View from Above	63
<i>Eclipse Weather!</i>	
The Fed Files	64
<i>Monitoring HUD</i>	
Tracking the Trunks	66
<i>Public Access Trunked Radios</i>	
Milcom	68
<i>Military Flight Demonstration Groups</i>	
American Bandscan	70
<i>Stamp Collecting and DX</i>	
Outer Limits	71
<i>USA-Sponsored Clandestine Activity</i>	
Below 500 kHz	72
<i>Can You Hear the Lowfers?</i>	
On the Ham Bands	74
<i>Going Mobile</i>	
Radio Restorations	76
<i>Recapping and Testing the Generator</i>	
Antenna Topics	78
<i>Antennas across the Spectrum: VLF-LF</i>	

MT Reviews

Computers & Radio	80
<i>Voice Command for your Receivers</i>	
Equipment	82
<i>The Henry Kloss Model One</i>	
Scanner Equipment	84
<i>Uniden BC780XLT Trunk Tracker</i>	
Easy Access	86
<i>Icom's Neat IC-718</i>	
MT Review	87
<i>MFJ-616 Speech Intelligibility Enhancer</i>	
What's New	88



Low Power FM Radio Crippled

"One of the fundamental tenets of our democracy is to ensure that diverse interests have opportunities to express themselves at different levels, and that they are not locked out in a monopolistic, globalized fashion. ... Radio is perhaps the most qualified of any media outlet to provide community access. ... Unfortunately, today's radio is the most concentrated and formulaic medium in the country." *From a March 10, 1999, letter from Congressman David Bonior to FCC Chairman William Kennard*

Most colleges, churches and community groups can forget about an FCC plan to create a new low power FM service. A late added amendment, buried deep within the massive \$1.8 trillion spending bill, has greatly curtailed a pet project of former FCC Chairman Bill Kennard to create 1,000 new low-power FM community radio stations.

The objective was to make the commercial FM airwaves more diverse by offering "niche" non-profit programming from local governments, educational organizations, neighborhoods, and community groups. It was Kennard's view that these voices had been silenced by the proliferation of an increasingly consolidated corporate radio market. At the end of 1999, the top ten broadcasters controlled 2,000 stations.

Existing FM radio broadcasters – represented by the *National Association of Broadcasters* (NAB) and *National Public Radio* (NPR) – lobbied long and hard against the initiative out of concern that the new service would siphon off their audience and interfere with their transmissions. When the coalition of lobbyists and broadcasters turned to Congress, the result was the *Radio Broadcasting Preservation Act of 2000*, (S.3020) introduced Sep. 7th by outgoing Sen. Rod Grams (R-Minn.) and spearheaded by Senate Majority Leader Trent Lott, long a supporter of the NAB.

The original House bill [H.R. 3439] "To prohibit the Federal Communications Commission from establishing rules authorizing the operation of new, low power FM radio stations" was amended in S.3020 to read "A bill to require the FCC to revise its regulations authorizing the operation of new, low-power FM radio stations."

"The 'compromise' legislation allows [low-power radio stations] to go forward, while minimizing interference for millions of radio listeners," said Edward Fritts, head of the *National*

Association of Broadcasters. In reality, it basically eliminates most of them.

Grams' bill allows up to nine remotely located low-power stations to be licensed right away to test the feasibility of LPFM stations. None can be in metropolitan areas. And instead of the FCC regulating radio stations, Grams' bill essentially transfers authority to approve and regulate LPFM to Congress who would later decide whether to introduce legislation allowing the agency to authorize more micro-radio stations.

Exactly what does the legislation say?

In a nutshell, the *Radio Broadcasting Preservation Act of 2000* requires the so-called "third-adjacent channel" protection to be maintained. That means that LPFM stations may not be located three channels away from existing FM stations. This has the effect of eliminating up to 80% of the available LPFM slots. The FCC may license low-power stations in places where there is no need to relax third-channel buffers such as in rural areas that do not have many FM stations.

The bill also specifically forbids the FCC from awarding a LPFM license to any applicant who has engaged in unlicensed operation at any time and under all circumstances.

The bill compels the FCC to further evaluate the need for third-adjacent channel protection. This is to be accomplished by an experimental program in no more than nine FM radio markets to test whether low-power FM radio stations will result in harmful interference to existing FM radio stations.

The FCC also must appoint an independent testing agency to oversee interference field tests, conduct "independent audience listening tests" and the public must be given an opportunity to comment on any interference potential ...a tactic that postpones any hope of full-scale LPFM until many years down the road.

A full report must be submitted by the FCC to Congress addressing the impact on (1) incumbent FM radio broadcasters, (2) the coming transition of terrestrial FM radio broadcasters to digital radio (also known as IBOC – In Band – On Channel), (3) stations that provide a reading service for the blind to the public and (4) FM radio translator stations.

Kennard believes the requirement that the FCC study the economic impact of LPFM stations on existing FM stations is contrary to the NAB's argument that its opposition to

low-power radio is based solely on the potential interference to existing FM stations. Actually, while unsaid, FM broadcasters are equally concerned about listeners being siphoned off to new competition within their market and their ability to attract advertising dollars.

LPFM applications pouring in

The FCC began accepting applications for Low Power FM licenses in phases – a few states at a time. The FCC even went as far as to post "LPFM Channel Finder" software on their website to help applicants locate an FM channel that meets the requirements. See: <http://www.fcc.gov/mmb/asd/lpfm>.

The first 5-day application period was May 30 to June 8, 2000, the second filing window was Aug. 28th to Sep. 1. The FCC said the third LPFM filing window would open as scheduled for five days beginning Jan. 16, 2001. Already over 1,300 applications for low-power FM licenses have been received from school systems, municipalities, churches, colleges and community groups in the first 20 states. The FCC was preparing to begin awarding licenses when the budget bill amendment was "ram-rodded" through Congress.

The same day that Pres. Clinton signed the budget bill, the FCC announced that it had selected 255 applications from the first 20 states that meet the new scaled-back criteria. School districts, musical arts associations, churches and ethnic organizations are among those chosen. They will receive their construction permits for the stations after a 30-day comment period.

Senate Commerce Committee Chairman John McCain (R-Ariz.), a strong supporter of LPFM stations, will seek to overturn the rider when the Senate reconvenes after the first of the year. He called the budget bill amendment "...an atrocity ...that will hurt minorities and small churches and organizations that want to broadcast local information."

Unlicensed FM broadcasting may escalate

In a Dec. 18th feature story, the *San Francisco Chronicle* newspaper said it believes "Pirate radio received an unintended boost with the death of the Federal Communications Commission's plan to license hundreds of low-power FM radio stations." National Lawyers Guild spokesman, Philip Tymon believes "What we're going to see now is the resurrection of a lot of unlicensed stations."



LETTERS TO THE EDITOR

Lunar Eclipse over the UK

Lawrence Harris used satellite imagery to predict when or whether the eclipse on January 9 would be visible from his location (see *View from Above*). "Attached is an image taken at 1900UTC during the partial phase when the moon was moving further into the earth's shadow. Heavy cloud cover prevented the best quality imagery being taken, but I felt that this looked rather dramatic. Image taken using CCD camera fitted with 200mm f/1 telephoto lens."



Kudos and Congrats

"Thanks to Bill Grove and all for the 'New Look' but especially for the boldface type in the Utility Logs! (We geezers need all the help we can get.) Best wishes for a good 2001! From a long-time (back to newsprint tabloid days) subscriber, Maury Midlo"

"I just received my January issue of *MT* and I just wanted to tell you I love its new look inside! 73, Ryan"

"Congratulations on your 20th anniversary! Time sure goes by quickly when you are having fun. I have enjoyed your *Monitoring Times* thoroughly year after year for almost as long. Jack Planinac K6FCF"

"To my friends at Grove, Thank you so much for the offer of the free electronic version of *MT*. We will be excited to receive it. The McCreery Middle School Amateur Radio Club will meet sporadically through the summer (field day, events station etc.) so, if it would be ok, just keep it coming! You guys are THE BEST company I've dealt with for all-around radio hobbyists, keep up the good work! Thanks again..73, Bill Menk N3FQL

Remember the Woodpecker?

Brian Rogers, a reader from West Sussex, England, has a website with four articles and a poster relating to the Russian woodpecker signal. He received permission to reproduce an article written some time ago by David Wilson for *Monitoring Times*. He says, "I have had a

lot of interest shown in the articles, which I hope forms a useful resource for those interested in this 'mother of all signals.' The main Woodpecker page is <http://dSPACE.dial.pipex.com/brogers/wpecker.htm>"

Roots of the Digital Revolution

Michael Graham forwarded a web site to share with *MT* readers: http://www.nsa.gov/wwii/papers/start_of_digital_revolution.htm. It's an article entitled "The Start of the Digital Revolution: SIGSALY Secure Digital Voice Communications in World War II" by J. V. Boone and R. R. Peterson. Michael says, "Pretty amazing stuff for the time. Yes, it's on the NSA site-which if you haven't poked around on, there's some cool stuff to be found :-). Thanks for a great magazine, and keep up the good work."

Macs and Below 500

Kevin Carey shared an email with us he received from Barry Williams, ba.williams@home.com. "I enjoy your column in *MT* and it is one of the reasons I've resubscribed recently. I don't have a lowband receiver yet, but do enjoy MW and HF quite a lot with my R-390As. I have an SP-600 enroute which is supposed to be a real gem. I'm going to start looking for a SP-600 VLF model for the low end stuff, but they are hard to find. Anyway, your info every month is quite fascinating. I am a former Army pilot and beacon chasing will be a nice hobby when I finally get to go after them."

"I too have Macs at home. Tried Windows boxes over the years and learned my lesson. We networked two Macs to cable modem rather quickly one day recently, but my son insisted on a Pentium III box. It took a week and a half to get him networked...and days and days of holding the phone to my head for tech support. I had forgotten how backwards those systems are."

"Your last column about using mostly a Mac hit home. I have run some programs under Virtual PC on my G3 with good results. Now that I am finally retired I plan on getting as many Windows radio applications as possible and seeing how they run under emulation. If you are interested I can let you know the list of what is good and bad. Or, maybe you already know more than I do. There are some good programs out there for Macs. Some are pretty old, but I have some stored away that need cataloging."

"I would be interested in any comments you may have on Macs and radio software...or in buying a LF receiver. Thanks for the great columns."

I'm sure you've done the internet research, Barry, but for new Mac owners, a good place to start is Chris Smolinski's page at

<http://www.blackcatsystems.com/software/ham.html> For general Mac programs try <http://www.ultimatemac.com> and <http://pure-mac.com> ... rb

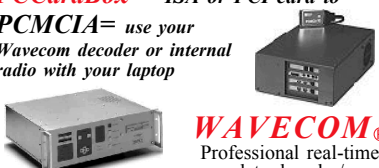
Not so blue after all

Doug Smith wrote with regard to Rick Sitz' letter (*21st Century Blues*) in January *MT*: "It is indeed scary that egg insulators are now a special order item at Radio Shack. But there are other places you can go. Home Depot (and I'm sure other similar home-improvement stores) sell PVC plumbing supplies. Plastic plumbing couplers make excellent end insulators, and plumbing tees make good center insulators. They're cheap, too. You can get the antenna wire there, too; the stranded stuff they sell for AC power wiring works great for antennas." - Doug Smith W9WI

We welcome your ideas, opinions, corrections, and additions in this column. Please mail to *Letters to the Editor*, PO Box 98, Brasstown, NC 28902, or email mteditor@grove-ent.com. Happy monitoring!

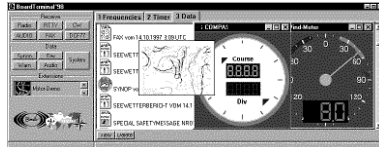
— Rachel Baughn, KE4OPD, editor

PCCardBox = ISA or PCI-card to
PCMCI= use your
Wavecom decoder or internal
radio with your laptop



WAVECOM®
Professional real-time
data decoder/
analyzer/processor of radio communication
transmissions, variable IF-interfaces, all major HF,
VHF, UHF, SHF and SAT modes/ codes

BoardTerminal/MeteoCom®




For marine use: Weather and navigation with your
laptop. Navtex-, synop-, fax- and CW-decoder.

RadioCom®
RX+TRX DSP, CAT,
decoding CW, PSK31, SSTV,
FAX, RTTY, Scanning, etc.

ARMAP® HAM-Label
Graphic Logbook, HAM Maps and
QSL-cards

COMPUTER INTERNATIONAL
207 South Old-US-27
ST. JOHNS, MI 48879-1903
Tel/Fax: 1 877 977 6918 toll free
info@computer-int.com
www.computer-int.com



Radio Honor Roll

Hams Respond to El Salvador Earthquake

Salvation Army Team Emergency Radio Network Director Pat McPherson, WW9E, conducts a routine daily net on 14.265 MHz at 1500 UTC, but the net was overwhelmed with pleas for and offers of help after the earthquake of January 13 claimed upwards of 700 lives in El Salvador and Guatemala.

Salvation Army International Disaster Services Coordinator Maj Mike Olsen reported that the Salvation Army served more than 18,000 hot meals per day, plus offering medical treatment to earthquake victims. McPherson expressed his appreciation to all amateurs who have been helping in the earthquake relief effort. "This kind of operation continues only through the great support of the Amateur Radio community and the dedication of folks driven to help those in need," he said. "Thanks to you all!"

A team of 22 Turkish rescue personnel was dispatched to the disaster scene. Heading up communications for the Turkish rescue team was Serdar Demirel, TA2NO. The team reportedly was equipped with an INMARSAT telephone and VHF and UHF amateur gear.

New FCC Head

President George W. Bush has named Michael K. Powell to become FCC chairman. Powell, a Republican and an FCC member since 1997, is the son of Secretary of State Gen. Colin Powell.

Powell succeeds William Kennard as the head of the FCC. During his three-year tenure, Kennard presided over major changes in the FCC and in telecommunications while implementing the Telecommunications Act of 1996.

Powell has served as the FCC's Defense Commissioner, responsible for overseeing National Security Emergency Preparedness functions for the Commission, and he also served as the FCC representative to the President's Council on Year 2000 Conversion. Prior to his tenure at the FCC, Powell served as the chief of staff of the Antitrust Division at the Department of Justice. He is a graduate of the Georgetown University Law Center, and holds a degree in government from the College of William and Mary.

The other members of the FCC are Susan Ness, Harold W. Furchtgott-Roth, and Gloria Tristani. Among names mentioned as possible Bush appointees to the FCC is that of Texas Public Utilities Commission Chairman Pat Wood.

March 6: D-Day for *Mir*

According to news reports, two Russian space agencies have agreed that March 6 will be D-Day for the *Mir* space station – "Deorbiting Day," that is. The more than 130-ton spacecraft will be pushed out of Earth orbit using Progress rockets. According to the Russian Aviation and

Space Agency and RKK Energia, a Progress cargo ship with increased fuel capacity will be launched to *Mir* January 18. It will displace a Progress rocket already docked to *Mir*.

The second Progress – heavily loaded with fuel for the deorbiting missions – will dock January 22. In the event of docking problems, Russia is prepared to send up an emergency cosmonaut crew to complete the job.

Mir's attitude control system will be disabled. Then, on March 4 and 5, the Progress will fire its engines and brake the station's orbital velocity. On March 6, the Progress will deliver the killer blow, firing to decrease *Mir*'s velocity to the point where it will drop out of orbit. What's left of the space station after it passes through Earth's atmosphere will plunge into the Pacific later that day. It's expected that the scuttling of *Mir* will generate a shower of debris that could reach Earth's surface.

Canada plans to lower Morse requirement

Canada's equivalent to the Federal Communications Commission (FCC), Industry Canada, has issued a Notice indicating their intent to amend Radio Information Circular RIC-2, to: "Grant Full Operating Privileges in all Amateur Radio Frequency Bands Below 30 MHz to Amateur Radio Operators Holding a 5 word per minute (w.p.m.) Morse Code Qualification." The full notice can be found on the Industry Canada Web site at: <http://strategis.ic.gc.ca/SSG/sf05327e.html>

The U.S. passed a similar measure in April 2000. The Amateur Radio Relay League (ARRL) plans to reexamine its 1993 Board resolution, which supports keeping the International Radio Regulations provision requiring applicants to demonstrate the ability to send and receive Morse code before they may operate below 30 MHz.

Take my wife, please

A Kenosha, Wisconsin, man listening on his scanner was entertained as he followed the progress of police chasing a suspected drunken driver a few days after Christmas. The female driver slowed to a stop and was finally arrested after zig-zagging through several neighborhoods at speeds of less than 35 mph. However, minor amusement soon turned to shock when the man heard his wife's name mentioned on the radio as the suspect.

Officer Paul Torres said the woman's husband showed up at the Police Department to claim the keys to the pickup truck his wife had been driving. The man refused to bail out his wife, however. "He said, 'You can keep her,'" Torres said. The woman reportedly told police she was afraid to pull over because of an earlier arrest for drunken driving.

A New GPS Sport

Do you have a GPS? Wonder what to do with it? Try hunting for "buried treasure"!



March 9-10: Kulpville, PA

14th Annual Winter SWL Fest sponsored by NASWA at Best Western—The Inn at Towamencin (formerly Holiday Inn). For rooms call (215) 368-3800; mention SWL Fest for special \$75 rate. Located at Exit 31 of the PA Turnpike Northeast Extension-Lansdale Interchange. Limo service is available from Phila. Intl Airport directly to the hotel.

Forums Friday and Saturday. No frills; just short-wave, longwave, mediumwave, pirates, and scanning. Saturday lunch pizza & salad buffet. Grand prize, silent benefit auction (brings items to be auctioned), raffle, hospitality room, Saturday banquet.

Late or On-Site Registration - Full registration: \$50; Two-day (no meals): \$20; One-day (no meals): \$10; Banquet only spouse/ son/ daughter: \$20. Send check to SWL Winterfest, P. O. Box 4153, Clifton Park, NY 12065

Up to the minute info on the Winter SWL Fest Web Page at <http://www.trsc.com/winterfest.html> or from <http://www.anarc.org/naswa/>.

SKYWARN Weather Observation Training: St Louis Co, MO

Saturday all-day classes: March 10, 17, April 7 Evening classes, level 1: March 21, 29

Level 1 training morning, Level 2 training afternoon. For locations and recorded info call 314-615-7857. Anyone may attend for SKYWARN and RACES certification; no charge. Monitor 146.940 MHz for severe weather net.

March 10: Harrison, AR

North Arkansas Amateur Radio Society hamfest at the Harrison Junior High School Cafeteria (515 South Pine Street - Highway 7 South), 8:00a.m.-1p.m., adm. \$5, under 16 free. To reserve tables: Bill Rose, N5VKF, 870-741-6968 or e-mail billrose@cswnet.com VE Testing, Refreshments, prizes, free parking, free tailgating.

March 17-18: Midland, TX

Midland ARC annual St. Patrick's Day Hamfest 8:00 - 5:00 Saturday, and 8:00 - 2:00 Sunday at Midland County Exhibit Building. Huge flea market inside, many dealers, large tailgate area, T-hunts, and full service concession stand. V.E. exams given at 1 PM on Saturday. Adm. \$8. For more information, Midland Amateur Radio Club, P.O. Box 4401, Midland, TX 79704; or e-mail Larry Nix, N5TQU oilman29@home.com or view <http://www.w5qgg.org>.

March 31-April 1: Timonium, MD

30th annual Greater Baltimore Hamboree and Computerfest at MD State Fairgrounds, Exit 16A off I-83 North, 8am-5pm and 8a.m.-3p.m. For more information see <http://www.gbhc.org>, call 410-HAM-FEST or (outside Md) 800-HAM-FEST or write GB&H, PO Box 95, Timonium, MD 21094-0095

Reception Reports

CHWO - AM 740 - Prime Time Radio, acknowledges all correct reception reports with a QSL card, information sheet on the station's history and transmitters as well as a program schedule. The QSLs will be issued by the Ontario DX Association: QSL manager Brian Smith. For fastest service send reception reports to: Ontario DX Association, P.O. Box 161 Station 'A', Willowdale, Ontario, Canada, M2N 5S8, or via adx@compuserve.com (Attn: QSL Manager)

There is a new sport called *GeoCaching*. Folks hide a small cache made up of a plastic food container, plastic bucket, military ammo can or the like and place it slightly off the beaten path. The latitude and longitude are then published on the internet at <http://www.geocaching.com> and then the fun starts.

Inside each cache are a number of things. Usually a logbook and pen, sometimes a disposable camera, and then miscellaneous inexpensive goodies. Using the GPS with the lat/log from the internet, folks search and find the GeoCache. When they do, they sign the logbook, take a photo of themselves if there is a camera, and maybe take one of the small treasures, replacing it with a new treasure they brought. Then they hide the box back where they found it for the next searcher to find. — Richard Amirault

AO-40 Antenna Systems May Be Damaged

The latest information on AO-40 (the Phase 3D amateur satellite project) suggests that the satellite might have suffered antenna system damage when it went silent last December 13. The satellite stopped transmitting while ground controllers were testing the propulsion system.

AMSAT-DL Vice President Peter Guelzow, DB2OS, reports that while the 2-meter, 70 cm and 1.2 GHz receivers are work-

ing on the high-gain antennas, none of them will work on the omnidirectional antennas. He speculated that either the omnidirectional antennas or the cabling or the antenna relays are damaged.

Guelzow said that AO-40's attitude control system is fully functional — something that would be critical to keeping the satellite in orbit on a long-term basis. But, the sun sensor's electronics have quit working. Guelzow expressed the hope that once the sun angle and antenna-pointing capabilities have been established, the ground crews will have a better chance to check out the status of the 2 meter and 70 cm transmitters through "better-controlled and suitable experiments."

British Gadget Guru Dies

Bob Tomalski, "gadget guru" for Radio Netherlands' *Media Network* and other broadcast and print publications passed away on Saturday 13th of January. The British "techno-journalist" was passionately interested in new trends. "Whether its recordable CD, a digital camera or a DVD player, I'm a sucker for buying them first," he said.

In the 1970s he was involved with many of the London free radio stations, putting pressure on the British government to open up the airwaves. He was a regular guest "guru" on the new stations such as GLR, Capital Radio and LBC. He

broke several technical scoops on UK television and lately was a regular guest on *Sky News*.

In fact, it was as he was preparing for a scheduled appearance on Sky Television's *Technofile* program that he suffered a fatal heart attack. He was about to turn 48 years of age. These web pages were posted in tribute and may still be active:

Tom Sundstrom -

http://www.trsc.com/musing_2001-01-18.html

Jonathan Marks at RNW -

<http://www.rnw.nl/realradio/html/tomalski010118.html>

Bob's homepage -

<http://www.medianet.demon.co.uk/>

WV, Bob's publisher -

<http://www.homecinemachoice.com/news/index.html>

"Communications" is compiled by Rachel Baughn, editor, from newscippings sent in by our readers. Many thanks to this month's reporters: Sterling Marcher, La Mirada, CA; Doug Robertson, Oxnard, CA; Robert Thomas, Bridgeport, CT. Via e-mail: Richard Amirault, P. Blumstein, Trevor Brook, Chanel Cordell, Robert Felton, Christopher Fleming, Paula Glovick, Maury Midlo, Eddie Muro, Laura Quarantiello, Tom Roach, Ryan, Tom Sundstrom, Rene Valladares, Jon Van Allen, Larry Van Horn, Robert Wyman. Our special thanks to the ARRL Letter.

DEDICATED TO THE SCANNING AND SHORTWAVE ENTHUSIAST

WE'RE MORE THAN JUST SOFTWARE!

NEW SUPPORT
For Uniden BC-780

SCANCAT GOLD for Windows "SE"

Since 1989, The Recognized Leader in Computer Control

Once you use SCANCAT with YOUR radio, you'll NEVER use your radio again WITHOUT SCANCAT!

SCANCAT supports almost ALL computer controlled radios by: AOR, DRAKE, KENWOOD, ICOM, YAESU and JRC (NPD) Plus PRO-2005/6/35/42 (with OS456/535), Lowe HF-150, and Watkins-Johnson

NOW SUPPORTS
UNIDEN BC-245 & BC-895
TRUNKTRACKER II
AOR AR-195 - AR8200B
& TEN-TEC RX320

SCANCAT GOLD FOR WINDOWS "SE"

(Surveillance-Enhanced)

All of Scancat Gold for Windows' Features PLUS:

- Selective Sound Recording using PC-compatible sound card. "Point & Shoot" playback by individual hits.
- Demographic search for frequency co-ordination and 2-way Usage Analysis.
- Detailed logging to ASCII type files with DATE, TIME, Sig Str, Air Time.
- 6 New Sweep Analysis Functions
- Exclusive "MACRO" control by frequency of Dwell, Hang, Resume, Sig, Threshold and even 6 separate programmable, audible alarms.
- Command line options for TIMED ON/OFF (Unattended) logging/searches.
- Run as many as 6 different C-V addressable radios as "Master/Slave".
- New! Scheduling/Recording functions.

With Scancat Gold for Windows "SE", your spectrum never looked so good! Load virtually "any" database and Scancat "SE" will examine your database, plot each and every frequency, no matter what the range... and "paint" the entire analysis on your screen.

SEVERAL GRAPHICAL ANALYSIS MODES AVAILABLE

- By Signal Strength per frequency in a "histograph."
- By Signal Strength plotted in individual dots
- By Number of hits per frequency in a "histograph."
- IF THAT ISN'T ENOUGH, try this... Multicolored, 3-D "Spatial/Landscape."

SCANCAT GOLD "SE" ...\$159.95 + S&H* UPGRADE SCANCAT GOLD V7.5.7 "SE" ...\$59.95** + S&H*

SCANCAT GOLD FOR WINDOWS' FEATURES

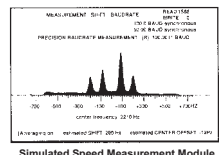
- Unattended Logging of frequencies
- Scan Create Disk Files
- Spectrum Analysis to Screen OR Printer
- Supports PerCon, Mr. Scanner, and Betty Bearcat CD Roms.
- Scan VHF & HF Icom's Simultaneously
- LINK up to 100 Disk files or ranges
- MULTIPLE search filters for Diskfile Scanning
- New - Programmable Favorite Frequency "Quick Buttons"
- Search by CTCSS & DCS tones with OS456/535 or CD440 (ICOM only)
- INCLUDES several large shortwave and VHF/UHF databases.
- VERSATILE "Functional" spectrum analysis, NOT just a "pretty face". Spectrum is held in memory for long term accumulation. Simply "mouse over" to read frequency of spectrum location. "CLICK" to immediately tune your receiver. You can even accumulate a spectrum from scanner DISKFILES of random frequencies!
- DIRECT scanner of most DBASE, FOXPRO, ACCESS,
- \$5 U.S. \$7.50 FOREIGN **WITHIN 1 YEAR OF ORIGINAL PURCHASE
- RETRIEVE files WITHOUT "importing."
- UNIQUE database management system with moveable columns. Even SPLIT columns into doubles or triples for east viewing of ALL important data on one screen
- Exclusive "SLIDE RULE" tuner. Click or "skate" your mouse over our Slide-Tuner to change frequencies effortlessly! OR use our graphical tuning knob.

HOKA CODE-3 GOLD

"The Standard Against Which All Future Decoders Will Be Compared"

Many radio amateurs and SWLs are puzzled! Just what are all those strange signals you can hear but not identify on the Short Wave bands? A few of them such as CW, RTTY, Packet and Amtor you'll know - but what about the many other signals?

There are some well known CW/RTTY Decoders but then there is CODE-3 GOLD. It's up to you to make the choice, but it will be easy once you see CODE-3 GOLD. All units have an exclusive auto-classification module that tells YOU what you're listening to AND automatically sets you up to start decoding. No other decoder can do this on ALL the modes listed below - and most more expensive decoders have no means of identifying ANY received signals! Why spend more money for other decoders with FEWER features? CODE-3 GOLD works on any IBM compatible computers with MS-DOS with at least 640k of RAM, and a VGA monitor. CODE-3 GOLD includes software and a complete audio to digital FSK converter.



Simulated Speed Measurement Module

Modes included in BASIC package	ADDITIONAL Modes included in STANDARD and PROFESSIONAL package
<ul style="list-style-type: none"> • Morse • RTTY/Baudot/Murray • Sitor CCIR 625/476-4 • ARQ - Navtex • AX25 Packet • Facsimile all RPM (up to 16 gray shades at 124x768 pixels) • Hellschreiber - Synchi/Asynch • ASCII • Factor • WEFAX 	<ul style="list-style-type: none"> • Autospec - Mk's I & 2 • DUP-ARQ Artrac • TWINPlex • ARQ-90/98 • SI-ARQ/ARQ-S • SWED-ARQ-ARQ-SWE • ARQ-E/ARQ1000 Duplex • ARQ-N-ARQ1000 Duplex Variant • ARQ-E3-CCIR519 Variant • PCL-ARQ 100 Baud • Duplex ARQ • TDM242/ARQ-M2/4-242 • TDM342/ARQ-M2/4 • FEC-A • FEC100A/FEC101 • FEC-S • FEC1000 Simplex • Sports info 300 baud ASCII • Sitor • RAW (Normal Sitor but without Synchi) • ARQ6-70 • Baudot F789N • 4 special ARQ & FEC systems: TORQ-10/11, ROU-FEC/RUM-FEC, HC-ARQ (ICRC) and HNG-FEC • Piccolo • Coquelet • SYNOP decoder

Additional CODE-3 GOLD PROFESSIONAL Analysis Tools

- Power Spectrum
- Waterfall Display
- AD Spectrum
- Oscilloscope
- Correlation XY
- Oscilloscope AFT (Amplitude, Freq., Phase)
- Phase Plane
- Correlation MOD
- Correlation Bit

CODE-3 GOLD is the most sophisticated decoder available for ANY amount of money.

CODE-3 GOLD VHF/SW DECODER \$450.00	CODE-3 GOLD VHF/SW DECODER \$595.00	CODE-3 GOLD PROFESSIONAL \$795.00
Includes POCSSAG & ACARS Plus* Modes/Options	With ALL Modes/Options	With ALL Modes/Options Plus Professional Analytical Package
BASIC	STANDARD	PROFESSIONAL

Now Available - Stridsberg Engineering Multicouplers - "Call for Quantity Pricing"
<http://www.scancat.com/multicplr.html>

FREE FREQ FILES

WEBSITE - www.scancat.com

E-MAIL - info@scancat.com

FREE DEMOS

Order direct or
contact your
favorite dealer

COMPUTER AIDED TECHNOLOGIES

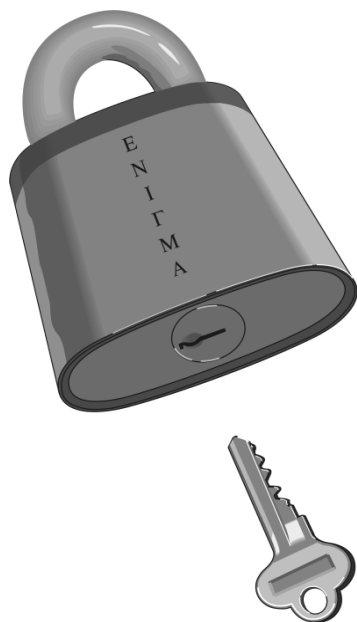
Phone: (318) 687-4444

FAX: (318) 686-0449

Info/Tech Support: (318) 687-2555 (9a.m. - 1 p.m. Central M-F)

P.O. Box 18285 Shreveport, LA 71138

Orders Only
888-SCANCAT
888-722-6228



The Key to the ENIGMA cipher...

by John Maky AC5ZX

Oftentimes when you see a spy “numbers” station log, such as in *MT’s Utility World*, you will see it referred to with a letter/number code. These codes, created by the European Numbers Information Gathering and Monitoring Association (ENIGMA) group in England, are used by numbers enthusiasts to differentiate between these mysterious broadcasts.

It certainly adds to the intrigue to call these stations by such names as “The English Woman,” “The Russian Man,” or “Bulgarian Betty.” However, once you really analyze these transmissions in detail, you will soon find languages are not necessarily a clue as to their origin. Although somewhat confusing to the uninitiated, these ENIGMA designations are relatively simple once you get used to them, and they provide a more accurate description once they are understood.

The first letter simply identifies the language or mode used by the station. These are...

E - English
S - Slavic
G - German
V - Various languages (including Spanish and oriental dialects)
M - Morse Code
X - Digital or unidentified modes

The number(s) that follow this identify the individual stations. Additionally, sometimes a suffix is added to further sub-classify variations of the same broadcast. You will soon see that “families” of these stations develop; as one intelligence agency will often operate with multiple languages and modes. Here are some examples of the most commonly reported stations...

E3

The “Lincolnshire Poacher” (England - Military Intelligence 6) is named for the interval signal sent at the top of the hour. It operates from 1200-2200UTC seven days a week. The message starts at :10 past the hour and consists of exactly 200 five-figure groups; each repeated twice. The synthesized female voice used has a distinctive English accent. The most commonly reported frequencies in North America are 9251, 11545,

12603, 13375, 14487, 15682, and 16084 kHz in USB. It is believed to be sent from British facilities inside Cyprus. The station is frequently jammed.

E3a

“Cherry Ripe” (England/MI6) also named for the tune chosen as an interval signal. Like its sister station, the Lincolnshire Poacher, it sends 200 five-figure groups – each one repeated twice. Cherry Ripe operates at 1000-1300 and 2200-0100 UTC. The frequencies used are 17499, 19884, 20474, 22108, 23461, and 24644 – all in USB. Cherry Ripe does not send traffic on weekends. Because of the different format and interval signal, it has been assigned an (a) suffix. It is thought to be transmitted from Guam.

E5

“The Counting Station” (USA/CIA) will send five-figure groups (with a distinctive pause between the third and fourth digits) after ten minutes of counting from 1-0. This “count” will be interspersed with the recipient’s call. Why this station counts is open to speculation, but may be simply to show how the text is to be presented. The entire message is repeated once, and never has more than 225 groups.

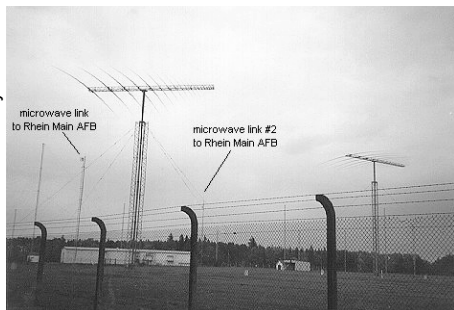
The Counting Station uses a form of reduced-carrier AM and sometimes USB. E5 can be found on many frequencies and will often stay on a set schedule for months. It can sometimes be found by searching through frequencies traditionally used in the past. This station is thought to be transmitted from Warrenton, Virginia, and also from US facilities near Frankfurt, Germany. It is interesting to note that The Counting Station generates significantly more traffic during times of international crisis.

E10

Believed to be part of Israel’s MOSSAD organization, “Three-Letter Phonetic” stations are found on over 100 different frequencies. The name derives from the phonetically pronounced calls



Warrenton Training Center. Photos by Chris Smolinski.



of CIO, EZI, ULX, YHF, KPA, VLB, or SYN heard at the beginning of a broadcast. Frequently these calls are followed by the number “2” which indicates there is no message to follow. Traffic is passed in five-letter groups by a female voice. E10 uses a form of AM that is most easily heard in USB mode. This is by far the most active numbers station in amount of broadcasts, but is often difficult to hear in North America.

E17

“The English Woman” (post-KGB intelligence services) sends five-figure groups, each repeated twice, with the broadcast ending 00000. The synthesized voice is somewhat gender neutral, causing the station to sometimes mistakenly reported as E6, “The English Man.” This station starts at any fifteen minute period during the hour, and puts a powerful signal into North America. E17 is thought to be sent from Russian facilities inside Cuba.

It has both Morse code (M14) and digital (XPH) counterparts listed below. E17 operates on seemingly random frequencies. Sometimes the station can be located by keeping an eye on irregular AM carriers found in the utility bands. The family of Russian stations is the most diverse in languages and operating modes, and therefore has the highest number of ENIGMA designators.

V2

The original “Atencion” station (Cuba/DGI) sends five-figure groups in Spanish. The name comes from the interval signal calling a three-digit addressee to “attention” at the top of the hour. This station has been on the air for over thirty years, and will only send traffic to one recipient. V2 will operate on a frequency for months; then suddenly change. V2 uses AM mode with a typically noisy carrier.

V2a

The newer “Atencion” station. This version first appeared in 1996 and is by far the most active of the two. It sends three 150-group messages to three different addressees starting on the top of the hour. Like V2, this station will stay on one frequency for months; then abruptly change. V2a also uses AM, and has a Morse code counterpart - M8a.

V5



“The Counting Station” just like E5, but this version sends its traffic in Spanish. This station will often remain on a schedule for years. Recent schedules are (all times in UTC) 0100 Wed/Fri on 13452//15651, 0300 Mon/Thu on 10665//11491, and 0300 Tue/Sat on 12300.5//14421. All these seem to be transmitted from the Warrenton, Virginia, site, so they are very easy to hear in the US. The Counting Station also had a German (G5) and Morse (M68) version once, but neither has been heard for some years.

V13

“New Star Broadcasting” (possibly Taiwan) uses four-figure group text in Mandarin Chinese. It can be found at the top and bottom of the hour on 8300, 9725, 11430, 13750, and 15388kHz. It operates between 2300-1600 UTC in AM mode. The V13 interval signal is a short oriental-sounding tune played on a flute. The energetic female announcer ends the broadcast wishing the recipient “health and happiness.”

M8a

The Morse version of V2a sends its five-letter group traffic in what is called “cut” numbers. This method consists of substituting the letters ANDUWRIGMT in place of numbers. It is much faster sending traffic in this fashion, as these are the shortest Morse characters. The station can be found starting at the top of the hour with its call to three different addressees. It operates on the same frequencies currently in use by V2a.

M14

The CW version of E17. The message is sent in rapid five-figure groups, with each group sent twice. This station also puts a tremendous signal into the US, sometimes using AM (modulated CW) mode. M14’s traffic starts at any fifteen minute period during the hour. Transmissions utilize a “short” zero (sent as the character T) in the message text. The broadcast ends with 00000.

M16

A CW station thought to be operating from France, using the bogus callsign 8BY. The transmissions last for twenty minutes, starting at :40 past the hour. The traffic consists of groups of three numbers, each divided by the slash symbol. It can be found on four frequencies selected from 7668, 10248, 12075, 14931, 18415, or 20945 kHz.

M22

Using callsign 4XZ, this station transmits 24 hours a day (usually a VVV marker) on a number of frequencies. Some of these are 4331, 6379, 8437, 9263, 10046, 10356, 14649, 17050, and 18482 kHz. This station is believed to be broadcast from Haifa, Israel. It is uncertain if this is directly associated with E10 transmissions; however, M22 has been noted mixing with them.

MX

Russian single-letter high-frequency channel markers are found in clusters near 5465, 7039, 8495, 10872, 13528, 16332, plus many others. The CW characters “C” and “S” are the ones most commonly heard in the US. It has been reported that these transmissions are propagation beacons used by the Russian Navy.

XPH

The “High-Pitch Polytone” station sends traffic at :20 minute intervals during the hour; most commonly starting at 0600 and 2000 UTC. It can be recognized by the eerie sounding call-up, which precedes a rapid-firing of digital tones containing the message. This station, as with most Russian stations, ends with tones representing zeros.

XM

“The Whales” or “Backwards Music Station” is often located near US military frequencies. No one is certain what these sounds are; but is probably an encrypted digital mode. This station is commonly found near 6817 and 11209 kHz.

There are over 200 numbers stations and their variants in ENIGMA’s classification list – far too numerous to list completely, and many have gone silent. The best way to find current information is by joining the SPOOKS reflector. This is easy to do by sending an e-mail to majordomo@qth.net and in the body of the message type subscribe spooks. You will then be sent an e-mail explaining how to complete the subscription.

The ENIGMA group used to put out an excellent newsletter, but it is no longer being published. The association still exists, however, and will continue to perform analysis on these stations. Their website is located at... <http://www.beaumont11.fsnet.co.uk/640x480/4.0/enter.html>

Three other excellent websites to visit have a wealth of information, current schedules, and some have a complete list of ENIGMA designators. They are:

<http://www.spynumbers.com/>
<http://home.luna.nl/~ary/>
<http://www.cvni.net/radio/nsnl/>

Now that you have a basic introduction into the numbers scene, listen in. Send your logs from this subversive side of radio to *MT’s Utility World*



Listening In On Europe

by Dave White

QSLs courtesy SWL QSL Card Museum,
<http://www.antique-corner.com/SWLQSL>

In the world of shortwave listening, those who thrive on chasing DX have Africa, Latin America, and Asia. Those who enjoy a constant supply of informative, entertaining program content have Europe.

Of course, Europe doesn't have *all* of the world's best internationally broadcast programs, but as a listening target, it has more than its share. The 2001 edition of *Passport to World Band Radio* features what it calls "Ten of the Best: 2001's Top Shows." Nine of them come from European broadcasters.

Some of the earliest roots of international broadcasting are deep in European soil, where many of the oldest and largest shortwave stations reside. It's common for these broadcasters to be celebrating 60th, 70th, or even 75th anniversaries. Europe has also long been a place from which broadcasters based in other parts of the world beam some of their programs.

While there's a certain thrill from digging a weak signal in an exotic language out of a sea of static, it's nice that there's a part of the world where virtually every country has a high power external service, with English language programming ranging from a few minutes to 24 hours a day.

European broadcasters have not been immune from budget cuts, political influence, or changes in philosophy and direction. Some have eliminated entire language services, or reduced the number of hours programmed. Some have shifted resources from shortwave to emerging broadcast technologies, particularly satellite and Internet. Some of the smallest, like Radio Luxembourg and Radio Andorra, have left shortwave altogether. Some, like Radio Yugoslavia, have been forced off the air indefinitely by war and political upheaval.

These ups and downs notwithstanding, worldwide shortwave broadcasting is alive and well in Europe, and while we hobbyists may not be the intended target audience, we are decidedly among the beneficiaries.

Easy Listening

Some European stations can be a bit of a challenge to receive in North America, but Europeans are, by and large, among the easiest loggings. Most transmit on multiple frequencies throughout the shortwave spectrum, using high wattage transmitters strategically located throughout the world. The

fact that so much of their programming is in English helps make identifying stations relatively easy. With a few exceptions, they tend to be on frequencies where there's little or no interference from other stations.

So, it's possible to listen to European stations literally at any hour of the day or night, on even the most modest equipment. For example, as this is being written, it's 10 AM in the Central time zone, and I'm listening to Spain's Radio Exterior España on a meager Radio Shack DX-395 portable with a bent telescoping antenna!

For the most part, program schedules for European stations are widely disseminated and easy to come by. Of course, your best source for an hour-by-hour listing of English language programs is *MT's* monthly *Shortwave Guide*. Virtually every station on the continent that has an external shortwave service also has a website with current program, frequency and schedule information.

We'll begin our tour in the part of the region that is the closest, both geographically and culturally, to North America.

British Isles

Even the newest or most casual listener has likely heard at least one of BBC World Service's program streams on its dozens of frequencies. BBC began its external service in 1932, and today claims a worldwide audience of 151 million.



drama, religion, talk shows, and quiz shows. It broadcasts in nearly 40 languages, with English predominance.

Radio Telefis Eireann (RTE Ireland) is celebrating its 75th anniversary this year, though its shortwave service is limited to half-hour daily segments on leased transmitters located in Britain, Canada, Singapore and Ascension Islands.

Wales Radio International consists of a weekly half-hour program called "Celtic Notes" which airs via leased transmitters in Britain.

United Nations Radio beams some of its daily 15-minute programs to Africa via transmitters in Britain.

Some of Radio Liberty's broadcasts originate from here.

Probably the only place to hear "underground dance music" on shortwave is on Britain's Virgin Radio / Global Sound Kitchen. It airs late nights (UTC) on weekends.

Western Europe

Radio France Internationale is another of the well-known "big gun" broadcasters. RFI has discontinued English programs beamed to North America, but their English service to Europe, Africa and Asia is usually audible in the U.S.

Italy is a major European country with a big stake in promoting tourism, but RAI International broadcasts English in only a few 10-, 15- and 20-minute snippets throughout the day. Italian Radio Relay Service (IRRS) hires out its shortwave transmitters to a mixture of program services ranging from religion to technology to old radio drama.



The small island nation of Malta is represented on shortwave by Voice of the Mediterranean, which is broadcast on transmitters located in nearby Italy and in Russia.

Sicily, another Italian neighbor in the Mediterranean, is home to one of the network of Armed Forces Network (AFRTS) stations that broadcast to service personnel at sea and on foreign soil.

Portugal's RDP International is one of the few major European broadcasters that have no English broadcasts. Radio Portugal does beam several hours of programming each day to North America, in Portuguese.

Spain's Radio Exterior de España (REE) broadcasts primarily in Spanish, but offers five hours of English each day to Europe, Africa and North America. Radio Free Europe and Radio Liberty also broadcast from Spain.

Switzerland is known for its beautiful Al-

GROVE

UNIDEN

BC780XLT	SCN 49	\$349.95
BC245XLT	SCN 35	\$199.95
BC895XLT	SCN 9	\$194.95

ALINCO

DJ-X2T	SCN 3	\$269.95
DJ-X10T	SCN 1	\$349.95

AOR

AR8200IIB	SCN 50	\$559.95
AR3000AB	SCN 26	\$1062.95
AR8600	SCN 8	\$899.95

YAESU

VR-500	SCN 6	\$324.95
--------	-------	----------

ICOM

R10	SCN 4	\$289.95
R2	SCN 5	\$169.95
R3	SCN 7	\$499.95

ANTENNAS

Austin Condor	ANT 14	\$29.95
Grove Scanner Beam	ANT 1	\$74.95*
800 MHz Portable w/straight conn.	ANT 22	\$29.95
800 MHz Portable w/right-angle conn.	ANT 23	\$34.95
OMNI II Scanner	ANT 5	\$29.95*
Professional Wideband Discone	ANT 9	\$99.95*
2 1/2" Long Close Range	ANT 18	\$15.95
Scantenna + 50' coax	ANT 7	\$54.95*
Stealth Mobile Monitoring	ANT 30	\$34.95*
Universal Telescoping	ANT 19	\$14.95
H800 Skymatch Active	ANT 15	\$129.95*
Stoner-Dymek Active	ANT 24	\$184.95
Active Duck	ANT 36	\$49.95
Select-A-Tenna	ANT21	\$59.95
Super Select-A-Tenna	ANT 40	\$189.95
AOR DA3000 Aerial Discone	ANT 11	\$129.00
AOR MA500 Wide Range	ANT 12	\$99.00
AOR SA7000 super-wide receiving	ANT 39	\$189.95
Nil-Jon mobile mag mount antenna	ANT 10	\$79.95

Shipping/Handling Charges

Total Order	Shipping Charges
\$1-\$99	\$5.95
\$100-\$399	\$7.95
\$400-\$899	\$11.95
\$900-\$1499	\$15.95
\$1500-\$1999	\$19.95
\$2000-\$2499	\$23.95
\$2500+	\$27.95

*price includes shipping within the US
Prices subject to change without notice.

ACCESSORIES

UNIDEN BC SCANNERS

Computer interface cable for BC895	ACC 15	\$29.95
Scanner Master Reaction Tuner	ACC 22	\$69.95
BP-180 Uniden battery pack	BAT 5	\$19.95
BP120 spare battery & charger	BAT 24	\$25.95
BC235/245 hard leather case	CAS 3	\$29.95
DC cord	DCC 7	\$15.95
BP-1200 Nickey Hydride battery	BAT 1	\$29.95
WinScan 780 Software	SFT 1	\$69.95

ALINCO SCANNERS

EBP-34N Longlife NiCd battery	BAT 21	\$79.95
EBP-37N Standard battery	BAT 21A	\$39.95
EDH-16 battery case, 4 "AA"	BAT 22	\$9.95
DJ-X10T soft case	CAS 19	\$12.95
EDC-36 car lighter cable w/filter	DCC 14	\$23.95

AOR SCANNERS

Extended memory card for AR8200II	ACC 27	\$79.00
AR8200II leather case	CAS 21	\$29.95
AR8200II soft case	CAS 25	\$12.95
Tape recording lead for AR8200II	CBL 7	\$61.00
Computer control lead for AR8200II	CBL 8	\$109.00
Interface cable- Opto Scout/AR8200II	CBL 9	\$35.00
AC adaptor for AR8200II	PWR 24	\$21.95

YAESU SCANNERS

Cigarette lighter cable for VR-500	DCC 17	\$22.95
VR-500 cloning software and cable	SFT 25	\$39.95

ICOM SCANNERS

R3 battery pack	BAT 4	\$46.95
R2 soft case	CAS 20	\$29.95
R3 leather case	CAS 2	\$19.95
R3 Cigarette Adaptor	DCC 18	\$24.95
R3 drop-in charger	PWR 15	\$69.95
R2 CS-R2 cloning software	SFT 7	\$12.50
R3 software for Windows 95/98	SFT 14	\$19.95

MISCELLANEOUS ACCESSORIES

50' of RG-6U cable	CBL 50	\$19.95*
100' of RG-6U cable	CBL 100	\$24.95*
Universal Cigarette Adaptor	DCC 3	\$12.95
GRE Super Amplifier	PRE 1	\$49.95
Scancat Gold for Windows	SFT 2W	\$99.95
Scancat Gold for Windows SE Upgrade	SFT 2SE	\$59.95
2001 Police Call CD-ROM	SFT 22-01	\$34.95

Grove Enterprises, Inc.
(800) 438-8155; (828) 837-9200

(828) 837-2216 fax

7540 Hwy 64 W; Brasstown, NC 28902

order@grove-ent.com

www.grove-ent.com

pine scenery and its absolute impartiality in world politics. Both are reflected in Swiss Radio International's programs. SRI offers a hefty schedule of English broadcasts.

The smallest country in the world is home of one of the oldest shortwave services. Vatican Radio has broadcast information about the Catholic Church worldwide since 1931. Today it broadcasts in about three-dozen languages, including English, using transmitters on its own soil, as well as in Russia, Uzbekistan and the Philippines.

Northern Europe (Scandinavia)

Radio Sweden offers the most English programming of any Scandinavian station, both in quantity and variety, covering news, health, economy, environment, and Swedish culture. English is beamed to North America 4-1/2 hours a day.



YLE Radio Finland broadcasts in half a dozen languages, including 11-1/2

hours of English to North America daily. Finland is also home to the fledgling Scandinavian Weekend Radio, which operates for 24 hours at a time on the first Saturday of each month. Billed as Scandinavia's first private shortwave station, SWR runs just 50 watts but its monthly broadcasts are usually heard in the Eastern part of North America.

For more than 50 years, Radio Norway International has broadcast its view of the world from some of its northernmost inhabited reaches. RNI currently beams some 13 hours of programs to North America each day, none of it in English. All of RNI's programs are in Norwegian.

Radio Denmark, using Radio Norway's transmitters, also eschews English in favor of all Danish language programming. 25-minute segments are beamed to North America at various times throughout the day.

Iceland Radio exists to reach fishing boats and Icelanders overseas, so some of its native language broadcasts are beamed to the U.S. Armed Forces Network (AFRTS) is awaiting Icelandic government approval to begin operating one of its shortwave relay stations here.

Central Europe

The epicenter of shortwave broadcasting in Europe would seem to be Germany.

The Deutsche Welle dynasty includes shortwave, medium wave and satellite broadcasting. DW has operated a regular shortwave service since 1953 and, while it has cut some of its 30+ language services, its extensive English schedule has been maintained. Germany also has several domestic broadcasters that are heard overseas, including Bayerischer Rundfunk, Sudwestrundfunk, Deutschland Radio Berlin, and Radio Bremen. Radio Free Europe and Radio Lib-



erty operate transmitters here, as do a number of non-European broadcasters, and several clandestine stations beaming signals to places like Burma (Myanmar), China, and Ethiopia.

Neighboring Netherlands is smaller but no less influential in media circles. It was the first country in Europe to begin regular shortwave broadcasting. Radio Netherlands was established in 1927 and today is one of the most popular outlets in the world via its radio, TV, and Internet operations. Radio Netherlands carries an extensive English schedule, with powerful relay transmitters scattered around the globe. RN was one of the first broadcasters to use satellites to send programs to its relay transmitters, and is at the forefront of a joint effort by several European broadcasters to establish worldwide standards for digital AM.

Radio Austria (ORF) recently suffered some huge budget hits that forced it to reduce its staff and broadcast schedule, and to move into the building housing Austria's domestic radio service. ORF still manages to maintain a substantial English language service.

Most of the programs on Belgium's Radio Vlaanderen are in Dutch, but there are a few hours of English daily to Europe, Asia, and North America. RTBF International is Belgium's French shortwave service, using transmitters located in Germany.

Radio Prague has been around since 1936, first as a Soviet Communist propaganda outlet. It now represents an independent Czech Republic with programs in a half dozen languages, including several hours a day in English.

Representing the other half of the former Czechoslovakia, Radio Slovakia International came into being in 1993. It broadcasts four half-hours of English each day.

Radio Budapest offers a diet primarily of news, commentary, and features. English programs are 30-minutes long, and are broadcast four times a day to North America and Europe.

Polish Radio Warsaw beams its English broadcasts to Europe, but is fairly easy to hear throughout the rest of the world. Poland is also home to Radio Racja, a station opposed to the government of Belarus, broadcasting exclusively in Belarusian.

Southeastern Europe (Balkan States)

Shortwave broadcasting in Greece began in 1940. Today, Voice of Greece offers a number of English broadcasts throughout the day, from its transmitters on home soil, and via Voice of America transmitters in Delano, California. It's all Greek on Radio Makedonias, also known as Macedonia Radio Station. Radio Free Europe and Radio Liberty also operate transmitters here.

A former Communist voice, Radio Tirana in Albania is another old-timer, beginning operations in 1938. It has trimmed its English service considerably, down to 90-minutes a day.

Radio Romania International is dedicated to teaching the world everything there is to know about Romania. English broadcasts are beamed throughout the day, throughout the world.

In Bulgaria, shortwave service dates back to 1929. Radio Bulgaria offers a modicum of English programming, and airs a variety of interest-

ing music and information programs.

Croatian Radio broadcasts almost entirely in Croatian, but does sprinkle brief English segments throughout its schedule.

Further to the east are another 20 or so countries that make up the Commonwealth of Independent States, countries that formerly made up what was known as the Soviet Union. But, alas, that's another article altogether!

The Future

European broadcasters continue to maintain a longstanding tradition of innovation. Fundamental changes in the way programming is delivered are already underway, with satellites and Internet playing an ever-increasing role. Regardless, there are still many millions of people in the world who don't have access to the new technologies, and whose link to the world is by way of conventional shortwave radio.

There will, no doubt, be more changes in programming directions, staffs, and technical resources. But for now, and for the foreseeable future, international broadcasting as we know it is alive and well in Europe. For that, those of us who may never get closer to Paris, Rome, or London than our radio rooms, are grateful.

About the author

Dave White (dave@k4cc.net) welcomes your comments, suggestions, and tales of shortwave listening adventures.

OVERSEAS GUESTS

Europe is a favorite location of non-European International Broadcasters

ADVENTIST WORLD RADIO

Germany
Italy
Slovakia

ARMED FORCES NETWORK

Iceland (pending)
Sicily

CHINA RADIO INT'L

France
Spain

GOOD NEWS WORLD RADIO

Germany

HCJB-ECUADOR

Great Britain

OVERCOMER MINISTRY

Germany

RADIO CANADA INT'L

Austria
Germany
Great Britain

RADIO JAPAN

Great Britain

RADIO KOREA INT'L

Great Britain

RADIO TAIPEI INT'L

Great Britain

RAINBOW RADIO

Germany

TRANS WORLD RADIO

Albania
Armenia
Germany
Moldova
Monaco
Russia
Uzbekistan

UNITED METHODIST RADIO

Germany

UNIVERSAL LIFE

Germany

VOICE OF AMERICA

Germany
Great Britain
Greece
Spain

VOICE OF HOPE

Germany

VOICE OF RUSSIA

Ireland
Vatican City

WORLD BEACON

Great Britain

WYFR

Great Britain

EUROPEAN SHORTWAVE SMORGASBORD

(Times UTC, frequencies kHz)

(See MT *Shortwave Guide* for English language broadcast schedules from the following stations.)

ALBANIA	Radio Tirana
AUSTRIA	Radio Austria International (ORF)
BELGIUM	Radio Vlaanderen International
BRITISH ISLES	BBC World Service
BULGARIA	Radio Bulgaria
CZECH REPUBLIC	Radio Prague
FINLAND	LE Radio Finland
FRANCE	Radio France Internationale
GERMANY	Deutsche Welle
GREECE	Voice of Greece
HUNGARY	Radio Budapest
ITALY	IRRS
	RAI International
NETHERLANDS	Radio Netherlands
ROMANIA	Radio Romania International
SWEDEN	Radio Sweden
SWITZERLAND	Swiss Radio International
VATICAN CITY	Vatican Radio

BELGIUM

RTBF International

French language service
0400-1930 9970 to Europe
9490, 17580, 21565, 17570 to Africa

BRITISH ISLES

RTE Ireland

0130-0200 6155 to Central America
1000-1030 11740 to Australasia
1800-1830 9895 to Middle East
1830-1900 13640, 21630 to U.S./Africa

United Nations Radio

African service
15265, 17580

Virgin Radio / Global Sound Kitchen

2200-2400 Fr/Sa 3955, 6170, 7165
0000-0200 Sa/Su 3955, 6180, 7165

Wales Radio International

2130-2200 Fr 6010 to Europe
0300-0330 Sa 9735 to North America
1130-1200 Sa 17650 to Australasia

CROATIA

Croatian Radio

to Europe / Africa
0500-1830 6165
0500-2100 13830
0600-1800 5830
2030-2315 6165

DENMARK

Radio Denmark

Danish to North America
0030-0055 9945
0130-0155 9945
0230-0255 9590
1330-1355 18950
1430-1455 18950
1530-1555 15735
1630-1655 18950
1830-1855 18950
1930-1955 15705
2330-2355 9945

FINLAND

Scandinavian Weekend Radio

1st Saturday each month
2200 Fr — 2200 Sa 11690, 11720

GERMANY

Bayerischer Rundfunk

6085 24 hrs.

DeutschlandRadio-Berlin

6005 24 hrs.

Radio Bremen

6190 24 hrs.

Sudwestrundfunk

6030, 7265 24 hrs.

GREECE

Radio Makedonias

Greek language service
0600-2300 9935 to Europe
0600-2300 11595 to Africa, Middle East, Russia
1400-2300 7430 to Europe

ICELAND

Iceland Radio

Icelandic language service
1215-1300 13865 to Europe
1410-1440 13860 to USA
1755-1830 11402 to Europe
1835-1905 13860 to USA
2300-2330 11402 to USA

MALTA

Voice of the Mediterranean

English language service
0700-0730 (exc. Sun.) 7150
0900-1000 (Sun.) 11770
2000-2100 (exc. Fri.) 7440

NORWAY

Radio Norway International

Norwegian service to USA
0100-0300 7465, 9590
0300-0400 7465
1200-1500 18950

1500-1700 15735, 18950
1700-1900 18950
1900-2000 15705
2300-0200 9945

POLAND

Polish Radio Warsaw

English to Europe
1300-1355 6095, 7270, 9525, 11820
2030-2125 6030, 7185, 7265, 9540

Radio Racja

Belarusian language service

0600-0800 6035
1100-1300 6180
1900-2100 6050

PORTUGAL

Radio Portugal

Portuguese service to USA

0000-0300 (Tu-Sa) 9715, 11655
0600-0800 (Mo-Fr) 11675, 15585
1300-2400 15540

SLOVAKIA

Radio Slovakia International

English service
0100-0130 5930, 7230, 9440
0700-0730 15640, 17550, 21705
1730-1800 5915, 6055, 7345
1930-2000 5915, 6055, 7345

SPAIN

Radio Exterior de España

English service to North America
0000-0200 6055
0500-0600 6055
English service to Europe / Africa
2000-2100 9595, 9680
2200-2300 9595, 9680

Listening is only half the fun...

POPULAR COMMUNICATIONS

is the other half.

If you enjoy radio communications in all its variety, you'll love Popular Communications

Since 1982 *Pop Comm* has delivered thousands of pages of great reading for both the radio enthusiast and the professional communicator.

Name your favorite interest... *Popular Communications* is there for you. Whether you're into Short-wave Listening, Scanner Monitoring, searching out Pirate Radio broadcasters, CB Radio, Satellite Broadcasting, ACARS, or Ham Radio; you name it, we cover it, every month.

Popular Communications

Subscribe today and save over 54% off the newsstand price. Save even more with two or three year subs!

YES! Enter my Subscription to Popular Communications today!

Name

Address

City State Zip

☐ Check ☐ MasterCard ☐ VISA ☐ AMEX ☐ Discover

Card No. Expires

Signature

	USA	Canada/Mexico	Foreign Air Post
1 Year	<input type="checkbox"/> 25.95	<input type="checkbox"/> 35.95	<input type="checkbox"/> 45.95
2 Years	<input type="checkbox"/> 45.95	<input type="checkbox"/> 65.95	<input type="checkbox"/> 85.95
3 Years	<input type="checkbox"/> 65.95	<input type="checkbox"/> 95.95	<input type="checkbox"/> 125.95

Allow 6 to 8 weeks for delivery

FOR FASTER SERVICE FAX 1-516-681-2926

MT 95

Popular Communications

25 Newbridge Road, Hicksville, NY 11801 Telephone (516) 681-2922



The Idiosyncrasies of QSLing Europe

by Gayle Van Horn



Are you new to the DX scene? Perfect...Europe is an ideal place to begin your DX prowess. European stations usually provide the beginning listener with their initial 25 or 30 stations heard. Program enthusiasts quickly discover that European stations provide some of the most diversified programming in the world. At the same time, despite their reputation as an "easy catch," verifying European stations can be equally as aggravating especially as harder-to-hear parts of the world, when you receive a no-data card or no card at all.

The same rules apply for sending reception reports to Europe – be polite, informative on programming, and be specific in what you want...a verification, please! Within your report ask if any stickers or pennants are available. In return, enclose a souvenir postcard (my favorite) or commemorative postage stamps with your report. Your report may so impress their staff it might even be read in the weekly mailbag show.

Danke Schön Deutschland

Fortunately, despite some financial setbacks, Germany's Deutsche Welle has retained their English broadcast. DW is a favorite among DXers for its powerhouse signals and generous enclosures of free stickers, postcards, and pennants, despite a "no-data" QSL card (except for special occasions or broadcasts). Their informative news magazine, *DW-radio tune-in*, is available online at <http://www.dwelle.de>.

Domestic broadcasting from Germany provides DXers an interesting alternative. Bayerischer Rundfunk from Munich is the public broadcasting authority for Bavaria.

Südwestfunk, a publicly owned station, transmits from Rohrdorf and is responsible for the Rhineland-Palatinate and southern Baden-Württemberg area. Their QSL policy includes a full data card. The pop/rock DJ's format is recognizable even in German.

RFE/RL

Radio Free Europe/Radio Liberty is a United States government funded service, headquartered in Prague, Czech Republic. Both stations share transmission facilities with Voice of America using shortwave transmitters in Germany, Portugal, Spain, and United Kingdom. Neither station broadcasts in English; however, their program-

ming format is easy to follow for reporting. Don't forget to ask for location notation on your verification, as each transmitter site counts as a separate country.

Belgium

Radio Vlaanderen International offers listeners a middle-of-the-road perspective on world affairs, transmitting from five sites. *Brussels Calling* is an excellent magazine show and a good place to begin your reporting. They remain a reliable verifier, and include stickers, cards, pennants and small souvenirs.

Radio-Television Belge de la Communauté Française (RTBF) is the broadcasting organization of the French-speaking community in Belgium. RTBF aims at listeners in Africa and consists of relays from RTBF's domestic radio channels. Transmitting via Deutsche Telekom facilities in Jülich, Germany, RTBF is usually verified within a month and accepts English reports. DXers mostly include one dollar and some souvenir postcards.

Dutch Treat!

For over 50 years, Radio Netherlands has treated their listening audience to some of the very best programming on shortwave, broadcasting from Holland, as well as high powered relay stations throughout the world. Thankfully, they have preserved their English service and remain a source few can surpass. Full data verifications are usually received within one-two months, with stickers, program schedules, and hobby related articles.

Viva La France!

Despite cutbacks and lack of a North American English service, Radio France International continues to dazzle their listeners with glitzy programming and an excellent news-oriented service. RFI's colorful cards and station memorabilia will complement your collection.

Moscow loses its Voice

The Voice of Russia, once a powerhouse broadcaster during the Cold War, has been reduced to coping with fewer hours, frequencies, and staff. VOR now QSLs via email, with occasional souvenirs for an exceptional technical report. Consider yourself lucky if you possess any of the former Radio Moscow souvenirs and friendly letters.

BBC and changing times

BBC began its external service in December of 1932 and remains a favorite for its extensive news coverage. Unfortunately, BBC has discontinued providing QSLs (*QSL Report*, March 1999), as well as other promotional materials, due to budget restrictions. Any QSL card or letter from the BBC should be considered a prize in your collection. However, it might be worth the effort to report an unusual or persistent interference on specific frequencies, which supposedly will be forwarded to the engineers.

It's all Greek to me

Although short on nightly programming, the Voice of Greece continues to please QSL collectors with the sights of a country rich in history and diversity. With one or two enclosed IRCs, your report will be rewarded with views of the magnificent ruins of the Acropolis and the Parthenon. Voice of America's Kavala transmitter site verifies from the Washington, DC, address within weeks.

In Need of a challenge?

Try Iceland! Iceland Radio-Ríkisutvarpið, broadcast under the authority of the Icelandic National Broadcasting Service from the capital city Reykjavik. They will accept English reports for their Icelandic programming, and verify with colorful scenery cards, normally within a few months.

SRI...still a hit!

Despite the closure of all but one remaining Swiss transmitter site, Swiss Radio International is still a hit with fans. Worldwide relay outlets assist the global signal, which stresses hard hitting news during the week, and has a decidedly lighter Swiss flair for weekends. Stickers, cards and souvenirs make SRI a keeper.

QSLing European stations continues to be an excellent starting point for beginners, despite their QSL peculiarities. Particularly easy to verify are Radio Austria, Radio Budapest, RAI, Radio Sweden, Spanish National Radio (Radio España) and Vatican Radio. European sites that relay other broadcasters provide an added opportunity to verify European countries. (See the accompany-

ing article by Dave White.)

Stations listed below range from the very easy to those requiring a bit more initiative and persistence.

EUROPE

Current status of station reply enclosures, postal requirements and QSL policy, or response time to be expected if known at press time.

Albania

Radio Tirana
(stickers, postcards, \$1.00 requested, slow-poor)
External Service
Rruga Ismail Qemali Nr. 11
Tirana, Albania

Armenia

Voice of Armenia/Radio Armenia
(postcards & stamps, slow-poor)
Radio Agency
Alek Manoukian Street 5
375025 Yerevan, Armenia

Radio Intercontinental
Vardanants 28
No. 34
Yerevan 70, Armenia

Austria

Radio Austria International
(postcards, stickers, fair-good)
Argentinierstrasse 31
A-1040 Vienna, Austria

Belarus

Radio Belarus International/Radio Minsk
(1.00 or one IRC helpful, fair-poor)
4 Krasnaja 4
220807 Minsk, Republic of Belarus

Belgium

(stickers, postcards, one IRC appreciated, very good)
Radio Vlaanderen International
B-1043
Brussels, Belgium

RTBF International
(stickers, brochures, very good)
B-1044 Brussels, Belgium

Bulgaria

Bulgarian National Radio
4 Dragon Tsankov Blvd.
1040 Sofia, Bulgaria

Radio Bulgaria
(\$1.00 or one IRC required for postage due to economic cutbacks, slow-irregular)
P.O. Box 900
BG-1000 Sofia, Bulgaria

Radio Varna
(one IRC or return postage helpful, very slow)
22 blv. Primorski
9000 Varna, Bulgaria

Czech Republic

(stickers, souvenirs & publications, return postage helpful, fair-slow)
Czech Radio
Vinohradska-12
120, 99 Prague 2, Czech Republic

Radio Free Europe/Radio Liberty
(USA address preferred, return postage not required)
Vinohradska 1110 00 Prague 1, Czech Republic

(or:) 1201 Connecticut Ave. N.W.
Washington, DC 20036 USA

Denmark

Radio Danmark
(\$1.00 or one IRC appreciated but not required, email reports accepted)
Radioavisen Rosenorns Allé 22
DK-1999 Frederiksberg C, Denmark

Finland

YLE/Radio Finland
(return postage appreciated, email reports accepted, irregular-slow)
Shortwave Centre
Box 78
00024 Yleisradio, Finland

Scandinavian Weekend Radio
(two IRCs required, email reports accepted)
P.O. Box 35
FIN-40321
Iyväskylä, Finland

France

Radio France International
(stickers, postcards, souvenirs & publications, return postage not required, good)
Boite Postal 9516
F-75016 Paris Cedex 16, France

Germany

Adventist World Radio/The Voice of Hope
Postfach 100252
D-64202 Darmstadt
Germany

(listener mail should be sent to:)
Adventist World Radio
(stickers, postcards, brochures, return postage appreciated not required, good-very good)
39 Brendon Street
London W1, United Kingdom (see also Italy)

(or:) Adventist World Radio
P.O. Box 29235
Indianapolis, IN 46229 USA

Bayerischer Rundfunk
(stickers & large program schedule booklet, one IRC helpful or mint postage appreciated, good)
Rundfunkplatz 1
D-80300
München, Germany

Christliche Wissenschaft (Christian Science)
(bi-monthly via Deutsche Telekom, Jülich, Germany)
see, *Shortwave Radio Station Jülich-Deutsche Telekom AG*.
Radiosendungen, E. Bethmann
P.O. Box 7330
D-22832 Norderstedt, Germany

Radio Croatia/Radio Hrvatska relay
(when active)
Hrvatski Info Centar/Radio Hrvatska
Meduliceva 13
HR-1000 Zagreb, Croatia

(or: Technical) Milan Prezeli
Franz-Lenbach-Str. 10
D-60596 Frankfurt, Germany

Deutsche Welle
(free pennants, stickers, souvenirs & publications, return postage not required, good-very good)
Raderbergguetel 50
D-50968 Cologne, Germany

Deutschland Radio Berlin
(English or German reports accepted, souvenirs usually included, fair-slow)
Hans-Rosenthal-Platz
D-10825 Berlin Shonberg, Germany

Deutschlandfunk
(English or German reports accepted, fair-slow)
Raderberggütel 40
D-50968
Köln, Germany

Evangeliums-Rundfunk
(see Monaco-Trans World Radio)

Good News World Radio via Jülich, Germany
(return postage appreciated, very irregular)
P.O. Box 805
Ft. Worth, TX 76101 USA

Lutherische Stunde
(religious programming occasionally broadcast over shortwave facilities in Europe. Replies irregularly to English, German preferred)
Postfach 1162
D-27363 Sottrum, Germany
(or) Clüversborstel 14
D-27367 Sottrum, Germany

Missionswerk Werner Heukelbach
(religious programming via Voice of Russia, replies to English & German)
D-51702 Bergneustadt 2, Germany

Mitteldeutscher Rundfunk
(stickers, souvenirs & brochures, online email form at website, relayed nightly via Bayerischer Rundfunk; accepts English or German, no return postage required, good)
Kantsrasse 71-73
Leipzig, Germany

ORB/Ostdeutscher Rundfunk Brandenburg
ORB-Fritz
P.O. Box 9099000
14439 Potsdam, Germany

Overcomer Ministries relay
P.O. Box 691
Waterboro, SC 29488 USA

Radio Free Europe/Radio Liberty
(see Czech Republic)
1201 Connecticut Ave., N.W.
Washington, DC 20036 USA

Radio Santeq
(German or English accepted, verified only if QSL requested in report, branch of Universal Life)
Marienstrasse 1
D-97070 Würzburg, Germany

Radio Vilnius
(via facilities of Deutsche Telekom, Jülich, Germany, see Lithuania)

Südwestrundfunk
(German or English accepted, return postage or \$1.00 required, fair-good)
Neckkartrasse 230
D-70190 Stuttgart, Germany

SW Radio Station/Deutsche Jülich Telekom
(reports via mail or FAX, Atten: Walter Brodowsky)
Rundfunksendestelle Jülich
Merscher Höhe D-52428, Jülich, Germany

Trans World Radio
(see TWR Monaco)

United Methodist Church via Jülich, Germany
General Board of Global Ministries
Atten: Shortwave Broadcast Reports
The United Methodist Church
475 Riverside Drive
New York, NY 10115

Universal Life/Universelles Leben
(stickers, souvenirs, publications. German, English or Spanish accepted, fair-poor)
Postfach 5643
D-97006
Würzburg, Germany

Voice of America relay
(stickers, return postage not required, good-very good)
330 Independence Ave., SW
Washington, DC 20547 USA

Greece

(stickers, small souvenirs, return postage or one IRC, fair-good)
Radiophonikos Stathmos Makedonias/ERT 3
Angelaki 2
546 21 Thessaloniki, Greece

Voice of America relay
(stickers, return postage not required, good-very good)
330 Independence Ave. SW
Washington, DC 20547 USA

Voice of Greece
(return postage not necessary but appreciated;
no taped reports, FAX, regular mail or
email files accepted, good-very good)
432, Messogion Av.
153-42 Athens, Greece

Hungary

Radio Budapest
(stickers, souvenirs & brochures, return
postage appreciated or one IRC, good)
Bródy Sándor utca 5-7
H-1800 Budapest, Hungary

Iceland

Icelandic National Broadcasting-Ríkisútvarpið
(\$1.00 or one IRC appreciated, fair-good)
International Relations Department
Efstaleiti 1
IS-150 Reykjavík, Iceland

Ireland

(brochures, one-two IRCs appreciated but not re-
quired, good)
Radio Telefís Éireann/RTE Overseas
Broadcasting Developments
RTÉ
Dublin 4, Ireland

Italy

Adventist World Radio/The Voice of Hope
(stickers, souvenirs, brochures, good-very good)
AWR Europe
P.O. Box 383
I-47100 Forlì, Italy

(English listeners)
AWR
39 Brendon Street
London W11, United Kingdom

Italian Radio Relay Service
(email replies preferred due to postage budget cuts)
IRRS-Shortwave
Nexus-IBA
Caixa Postal 10980
20100 Milano, Italy

Radio Europe
(souvenirs for sale, two IRCs or return postage re-
quired)
P.O. Box 12
20090 Limoto di Piottello
Milan, Italy

Radio Maria Network Europe/Spoleto Relay
(when active)
Via Turati 7
22036 Erba, Italy

RAI International/Radio Roma
(stickers, pennants & brochures, one-two IRCs, slow
to irregular)
External/Foreign Service
Centro RAI
Saxa Rubra, 00188 Rome, Italy

(or:) P.O. Box 320
Correspondence Sector
00100 Rome, Italy

Radio Speranza, Modena
(when active; replies regularly to Italian reports)
Largo San Giorgio 91
41100 Modena, Italy

RTV/Italiana RAI
(recommend reports be sent to RAI Rome
address, irregular-poor)
Domestic Services
Radio Uno-Caltanissetta
Via Cerde 19
90139 Palermo, Sicily, Italy

Tele Radio Stereo, Roma
Via Bitossi 18
00136 Roma, Italy

Lithuania

Lietuvos Radio
Sausio 13-osios 10
LT-2044 Vilnius, Lithuania

Radio Vilnius/Lithuanian Radio
(stickers, one-two IRCs appreciated, slow-irregular)
Lietuvos Radijas
S. Konarskio 49
LT-2674 Vilnius, Lithuania

Malta

The Voice of Africa
P.O. Box 17
Hamrun, Malta

Voice of the Mediterranean/Radio Melita
(stickers & souvenirs, one-two IRCs appreciated,
good)
St. Francis Ravelin
Floriana, VLT 15, Malta

Moldova

Radio Moldova International
Maison de la Radio
Miorita str.1
277028 Chissinau, Moldova

(Reception Reports)
(\$1.00 appreciated, fair-irregular)
RMI-Monitoring Action
P.O. Box 9972
277070 Chisin _u-70, Moldova

Monaco

Trans World Radio
(stickers, pennants, brochures, good-very good)
Boite Postal 349
MC-98007
Monte Carlo, Monaco-Cedex

Netherlands

(stickers, pennants, souvenirs, brochures; one
IRC appreciated, very good)
Radio Netherlands
P.O. Box 222
1200 JG Hilversum, The Netherlands

Norway

(stickers, postcards, brochures, one IRC appreciated,
good)
Radio Norway International
Utenlandssendingen
NRK, N-0340 Oslo, Norway

Poland

Radio Maryja
(see Russia)

Radio Polonia
(stickers, postcards & souvenirs, poor-very slow)
External Service
P.O. Box 46
PL-00-977 Warsaw, Poland

Portugal

Radio Free Europe/Radio Liberty
(see Germany)

Radio Portugal International/Radio Portugal
(postcards, one-two IRCs appreciated, fair-good)
Apartado 1011
1001 Lisbon, Portugal

Romania

(stickers, postcards & pennants, one-two IRCs
appreciated, fair-slow)
Radio Romania Actualitati/ Radio Romania Inter-
national
60-62 Berthelot St.
(or) P.O. Box 111
70756 Bucharest, Romania

Radio Moldova International
(see Moldova)

Russia

Adygey Radio/Radio Maykop
(\$1.00 or one-two ICs helpful, English reports
accepted, Russian preferred)
ul.Zhukovskogo 24
352700 Maykop
Republic of Adygeya, Russia

Amur Radio
GTRK Amur
per Svyatitelya Innokentiya 15
675000 Blagoveschensk, Russia

Arkhangel'sk Radio
(Russian reports, irregular-poor)
GTRK "Pomor'ye"
ul. Popova 2
163000 Arkhangel'sk
Arkhangel'skaya Oblast, Russia

(or:) U1PR
Valentin G. Kalasnikov
ul. Suvarov 2
kv. 16, Arkhangel'sk
Arkhangel'skaya Oblast, Russia

Bashkortostan Radio
(Russian reports, irregular-poor)
ul. Gafuri 9/1
450076 Ufa
Bashkortostan, Russia

Buryat Radio
Dom Radio
ul. Erbanova 7
670013 Ulan Ude, Republic of Buryatia, Russia

Chita Radio
(when active)
ul. Kostushko-Grigorovicha 27
672090 Chita, Oblast, Russia

Evenkiyskaya Radio
(Russian reports, irregular-poor)
ul. 50 let Oktyabrya 28
663370 Tura
Evenkiyskiy Avt, Okrug, Russia

Islamic Wave/Islamskaya Volna
(\$1.00 or one-two IRCs required, Russian reports)
Islamic Centre, Moscow Jami Mosque
Vypolzov pereulok 7
129090 Moscow, Russia

(or:)Islamskaya Volna,
ul. Pyatnitskaya ulitsa 25
133326 Moscow, Russia

Kabardino-Balkar Radio/Radio Nalchik
(Russian reports)
ul. Nagmova 38
360000 Nalchik
Republic of Kabardino-Balkariya, Russia

Kala Atouraya/Voice of Assyria
(when active)
(\$1.00 or one-two IRCs required, poor-irregular)
ul.Pyatnitskaya 25
113326 Moscow, Russia

Kamchatka Radio
(when active)
RTC Centre
Dom Radio
ul. Sovetskaya 62-6
683000 Petropavlovsk-Kamchaskaya Oblast, Rus-
sia

Khabarovsk Radio
RTV Centre
ul. Lenina 71
680013 Khabarovskiy Kray, Russia
(or:) Dom Radio
ol.Slavy
682632 Khabarovsk, Khabarovskiy Kray, Russia

Khanty-Mansiysk Radio
Dom Radio
ul. Mira 7
626200 Khanty-Mansiysk
Khanty-Mansiyskiy Avt. Okrug
Tyumenskaya Oblast, Russia

Koryak Radio
ul. Obukhova 4
684620 Palana
Koryakskiy Khrebet, Russia

Krasnoyarsk Radio
(English or Russian reports, \$1.00 or one-two
IRCs appreciated)
GTRK "Central Russia"
ul. Mechnikova 44A,
666001 Krasnoyarsk 28
Kradnoyarskiy, Kray, Russia

Magadan Radio/Radio Pacific Ocean
(Russian reports preferred, \$1.00 or one-two IRCs)
RTV Centre
ul. Kommuny 8/12
685013 Magadan, Magadanskaya Oblast, Russia

Mariy Radio
Mari Yel, ul Osipenko 50
42404 Yoshkar Ola, Russia

Murmansk Radio
Sopka Varnichnaya
183042 Murmansk
Murmanskaya Oblast, Russia

(or:) RTV Centre
Sopka Varnichaya
183042 Murmansk
Murmanskaya Oblast, Russia

Perm Radio
Permskaya Gosudarstvennaya Telekinoradio-
kompaniya
ul. Technicheskaya 21
614600 Perm, Permskaya Oblast, Russia

Radio Maykop/Adygey Radio
ul. Zhukovskogo 24
352700 Maykop
Republic of Adygeya, Russia

Radio Mix Master
(when active)
Office 1, ul. Oktyabr'skaya 20/1
1, 677027 Yakusk, Respublikaakha
Sakha, Russia

Radio Nakchik/Kabardino-Balkar Radio
ul. Nogmova 38
360000 Nalchik
Republic of Kabardino-Balkariya, Russia

Radio Rossii/Russia's Radio
Room 121
ul. Yamskogo 5-A
Polya 19/21
125124 Moscow, Russia

Radio Samorodinka
P.O. Box 898
Centre, 101000 Moscow, Russia

Radio Maryja
ul. Zwirki i Wigury 80
PL-87-100 Toruni, Poland

Radiostantsiya Mayak
(broadcast via Turkmen Radio & other services,
Russian reports preferred, English accepted)
ul. Pyatnitskaya 25
113326 Moscow, Russia
(or:) ul. Akademika Koroleva 12
1277427 Moscow, Russia

Radiostantsiya Tikhiy Okean
(when active)
RTV Centre
ul. Uborevieha 20A
690000 Vladivostok, Primorskiy Kray, Russia

Sakha Radio
(stickers, souvenirs and Russian books for sale,
English reports accepted)
GTRK Respubliki Sakha
ul. Ordzhonikidzee 48
677007 Yakutsk, Respublika Sakha, Russia

Sakhalin Radio
GTRK Sakhalin
ul. Komsomolskaya 211
693000 Yuzhno-Sakhlinsk
Sakhalinskaya Oblast, Russia

Tyumen' Radio
(Russian reports only)
RTV Centre
ul. Permyakova 6
6, 625013 Tyumen'
Tyumenskaya Oblast, Russia

Voice of Assyria/Kala Atouraya
(when active)
ul. Pyatnitskaya 25
113326 Moscow, Russia

Voice of Russia
(due to budget cuts, VOR has reduced their mail
service considerably, and prefers email reports. If
writing by regular mail, please include your email
address if you have one. Souvenirs and stickers are
occasionally available on request as well as pur-
chases of books and music cassettes.)
ul. Pyatnitskaya 25
Moscow 113326, Russia

Voice of Tatarstan/Tatarstan Awazy
(Russian or English, QSL diploma program avail-
able for two IRCs)
QSL Manager
P.O. Box 134, Kazan
Tatarstan, 420136 Russia

(or:) Ulitsa M. Gorkogo 15
420095 Kazan, Tatarstan, Russia

Sicily
Armed Forces Radio/AFRTS
Naval Media Center
NDW Anacostia Annex
2713 Mitscher Rd., SW
Washington, DC 20373-5819

Slovakia
(stickers, pennants, souvenirs & publications,
one-two IRCs, fair-good)
Radio Slovakia International
M. tna 1
P.O. Box 55
81755 Bratislava 15, Slovakia

Spain
Radio Free Europe/Radio Liberty
(see Germany)

Spanish National Radio/Radio Exterior de España
(stickers, pennants, tourist brochures, one IRC ap-
preciated, good-very good)
Relaciones con la Audiencia
Sección DX
Apartado de Correos 156.202
E-28080 Madrid, Spain

(or:) Apartado de Correos 156.202
E-28080 Madrid, Spain

Sweden
(stickers & pennants, heard over Monaco's TWR;
\$1.00 or one IRC, slow-irregular, accepts email re-
ports)
IBRA Radio/International Broadcasting Association
Box 396
SE-105 36 Stockholm, Sweden

Radio Sweden
(stickers, postcards, souvenirs for sale, online re-
ception report form, one IRC appreciated, very good)
SE-105 10 Stockholm, Sweden

Switzerland
European Broadcasting Union
Case Postal 67
CH-1218 Grand-Saconnex, Geneva, Switzerland

International Telecommunication Union
Place des Nations
CH-1211 Geneva 20, Switzerland

Mitternachtsruf
(stickers, brochures, one IRC appreciated)
Postfach 290
Eichholzstrasse 38
CH-8330 Pfaffikon, Switzerland

Swiss Radio International
(stickers, posters, pennants; souvenirs for sale, one
IRC appreciated, very good)
Giacomettistrasse 1
CH-3000 Berne 15, Switzerland

Tajikistan
Radio Tajikistan
(English reports to attention of Mr. Ramazonov,
with caution if contacting him via email
<nadir@uralnet.ru>

as he is charged for incoming/outgoing mail. En-
closures of currency not recommended due to postal
theft, personal souvenirs may assist your reply.)
Chapaev Street 31
734025 Dushanbe, Tajikistan
(or:) English Service
International Service, Radio Tajikistan
P.O. Box 108
734025 Dushanbe, Tajikistan

Voice of Russia relay
(see Voice of Russia)

Ukraine
Radio Ukraine International
(stickers & souvenirs, currency or IRCs not
recommended due to postal theft, registered
mail may assist your reply, slow-poor)
Kreshchatik str.
26, 252001 Kiev, Ukraine

United Kingdom
Adventist World Radio/The Voice of Hope
AWR
(see Germany for USA address)

BBC World Service
discontinued QSLing. Souvenirs, books and videos
available for sale only) *BBC On Air* magazine sub-
scription available.
Bush House, Strand
London WC2B 4PH, United Kingdom

FEBA/Far East Broadcasting Association
(stickers, brochures, return postage not required,
good)
Ivy Arch Road
Worthing
West Sussex BN14 8BX, United Kingdom

Global Sound Kitchen via Merlin Comm.
(see Virgin Radio)
G-One Ltd., 50 Lisson Street
London, NW1 5DF United Kingdom

High Adventure Radio/Voice of Hope
P.O. Box 109
Hereford HR4 9XR, United Kingdom

IBC-Tamil
P.O. Box 1505
London SW8 2ZH, United Kingdom

Merlin Communications International Limited
(does not verify reports)
20 Lincoln's Inn Fields
London WC2A 3ES, United Kingdom

Radio Korea Int'l relay
18 Yoido-dong
Youngdungpo-gu
Seoul, Republic of Korea

Virgin Radio via Merlin Communications.
c/o Mr Lee Roberts
1 Golden Square
London W1R 4DJ United Kingdom

World Beacon relay
P.O. Box 651525, Benmore 2010, South Africa

Vatican City State
(stickers, postcards, posters, souvenirs for sale, re-
turn postage not required, very good)
Vatican Radio/Radio Vaticana
00120 Citta del Vaticano, Vatican City State

Wales
Wales Radio International/via Merlin
Communications.
c/o Jerry O'Brien
Preseli Radio Productions
Pros. Kairon, Crymch
Pembrokeshire
SA41 3QE Wales

Yugoslavia (Federal Republic)
(when active)
(stickers, pennants, tourist brochures, \$1.00 may
assist reply, unknown when the station will resume
broadcasting, transmitting facility ordered aban-
doned by Bosnian authorities)
Radio Yugoslavia
Hilendarska 2
P.O. Box 200
11000 Belgrade, Serbia, Yugoslavia



Scanning Roadtrip: Florida-bound

By John Mayson

A few months ago we visited I-35 in Texas. This is a major Interstate for commerce as it is part of the NAFTA Highway linking Mexico, the United States, and Canada. This month we're going to visit another important highway, I-4 in sunny Florida, plus other central Florida counties catering to tourists.

I-4 connects Tampa, Orlando, and Daytona Beach. All three communities are popular vacation spots. During the peak of the tourist season, I-4 often is clogged with families traveling between the beautiful Gulf Coast beaches, the Orlando area theme parks, and the famous boardwalk of Daytona Beach.

Unfortunately too often drivers will lose their focus and find themselves in an accident. Monsoon-like summer rains and heavy traffic also contribute to accidents and delays along the central Florida corridor. Emergency personnel race to the scene, not only to tend to the injured, but also get traffic flowing as quickly as possible. Rather than letting the traffic snarls ruin your vacation, take along your scanner and enjoy some great monitoring.

Equipment

Florida is perhaps the most "trunked" state in the nation. South Florida was home to one of the first trunked public safety systems in the country. The state has built a mammoth Motorola Astro trunked system extending from Key West up through Orlando. Virtually every county, city, and town we visit this month uses trunking. With that in mind a trunking capable scanner is a must for monitoring in central Florida. You can scan a trunked system with a conventional scanner, but given the number of users

on every system, scanning them will be more frustrating than the traffic.

Florida's Law Enforcement Structure

At the state level, there are three law enforcement agencies. The most well known and most visible is the Florida Highway Patrol (FHP). The FHP is tasked with patrolling the state's highways and enforcing traffic laws.

The lesser-known agencies are the Florida Department of Law Enforcement (FDLE), the Florida Marine Patrol (FMP), and the Florida Fish and Wildlife Conservation Commission (FFWCC). The FDLE is the state crime investigative unit. FDLE assists local law enforcement with major crimes, performs background checks for firearms purchases, and operates the state crime lab.

The FFWCC is a new agency formed when the Marine Patrol and Game & Freshwater Fish Commission combined. This agency patrols bodies of fresh and salt water under Florida's territorial jurisdiction and enforces boating and fishing regulations, along with enforcing hunting regulations.

Every county has a Sheriff's Office that provides law enforcement to the unincorporated parts of the county and to cities and towns that do not choose to have their own police force. Florida has a standard white and green paint scheme for all sheriffs' office patrol cars in the state.

VOLUSIA COUNTY

Volusia County is home to the

"World's Most Famous Beach," a well-known race track, and sees millions during Bike Week, Beach Week, and spring break. Daytona Beach is by far the most famous city in this county and Deland is the county seat.

Volusia County operates an EDACS TRS.

Volusia County Trunked Radio System EDACS Analog

Daytona Beach System Frequencies

Frequencies	LCN
856.7125	1
857.2125	2
858.2125	3
859.2125	4
860.2125	5

A System Frequencies

Frequencies	LCN
855.2125	1
856.7375	2
857.2625	3
858.2625	4
858.7625	5
859.7375	6
860.7125	7
855.7375	8
856.7625	9
857.7375	10
858.7125	11
859.4875	12
860.2625	13
860.7625	14

B System Frequencies

Frequencies	LCN
856.2625	1
856.9875	2
857.7625	3
858.4875	4
859.7125	5
860.4875	6
855.4625	7
856.4875	8
857.4875	9
858.7375	10
859.2625	11
859.7625	12
860.7375	13
856.9375	14

Volusia County Sheriff's Office Talkgroups

AFS	Chan	Description
01-061	1	North Dispatch
01-062	2	South Dispatch
01-074	3	East Dispatch
01-065		Teletype
01-066		
01-021		Prisoner Transport
01-022		Courthouse Security
01-025		Judicial Services Division
01-041		SRT
01-042		ERT - Dispatch
01-043		SID-1
01-044		SID-2
01-045		SID
01-047		
01-070		TAC 1
01-071		TAC 2
01-075		TAC 3
01-072		SR
01-147		Citizen Observer Patrol
01-152		Patrol
01-153		Intercity
01-154		Air Channel
01-155	1	Mutual Aid 1
01-156	2	Mutual Aid 2
01-157	3	Mutual Aid 3
09-141	1	Countywide 1
09-142	2	Countywide 2
09-156	1	Countywide 1
09-157	2	Countywide 2

Volusia County Fire-Rescue Talkgroups

AFS	Chan	Description
02-021		Memorial Hospital - Peninsula
02-022		Memorial Hospital - Ormond Beach
02-023		Halifax Medical Center
02-024		Bert Fish Medical Center
02-025		Florida Hospital
02-026		Deland Hospital
02-027		Atlantic Medical Center
02-030		Florida Hospital/Fish Memorial Medical Center
02-037		Hospital
02-041	TAC 1	- Dispatch
02-042	TAC 2	
02-043	TAC 3	
02-044	TAC 4	
02-045	TAC 5	
02-046	TAC 6	
02-047	TAC 7	

02-050 TAC 8
 02-051 TAC 9
 02-052 TAC 10 Training A
 02-053 TAC 11 Training B
 02-054 TAC 12 Training C
 02-055 TAC 13
 02-063 TAC 14 Admin
 02-064 TAC 15 Fire Police
 02-071 VC Fire
 02-081 1 EMS Dispatch
 02-082 2 EMS Dispatch
 02-083 3 EMS Dispatch
 02-090 TAC
 02-091 EVAC 1
 02-092 EVAC 2
 02-155 Fire 1 Mutual Aid
 02-156 Fire 2 Mutual Aid

Volusia County Beach Patrol & Lifeguards
 Talkgroups
 AFS Chan Description
 12-025 DB-1 Daytona Beach
 12-035 DB-2 Daytona Beach
 DB-2
 12-032 DBS-1 Daytona Beach
 Shores DBS-1
 12-027 NSB-1 New Smyrna
 Beach
 12-036 NSB-2 New Smyrna
 Beach
 12-021 OB-1 Ormond Beach
 12-026 OB-2 Ormond Beach
 12-023 Sheriff - Common
 12-030 Beachway (toll-
 booths)
 12-031 Beachwide

Daytona Beach Police Talkgroups
 AFS Chan Description
 11-061 1 Mainland
 11-062 2 Beaches
 11-063 3 Tactical
 11-065 4 Teletype
 11-071 Direct
 11-106 Narc 2
 11-107 Narc 3
 11-110 Narc 4
 11-111 Narc 5
 11-115 Special Events
 14-001 1 Mainland
 14-002 2 Beaches
 14-003 3 Tactical
 14-004 4 Teletype
 14-005 Special Events
 14-010 Event Traffic
 14-011 Special Events - Traf-
 fic car to car

Daytona Beach Fire Talkgroups
 AFS Description
 11-041 Dispatch
 11-053 Talkaround

Daytona Beach Shores Police Talkgroups
 AFS Description
 04-061 Dispatch
 04-062 Channel 2
 04-066

Deland Police Talkgroups
 AFS Chan Description
 09-061 1 Dispatch
 09-062 2
 09-063 3

Deland Fire Talkgroups
 AFS Description
 09-021 Dispatch
 Deltona Police Talkgroups
 AFS Description
 13-061 Dispatch Tac 1
 13-062 Tac 2
 13-063 Tac 3
 13-065 Tac All
 13-066 Common

Deltona Fire Talkgroups
 AFS Description
 13-070
 13-071
 13-076 Admin
 13-077 Tac 5

Edgewater Police Talkgroups
 AFS Chan Description
 08-141 1 Dispatch
 08-142 2 Teletype & Tactical

Edgewater Fire Talkgroups
 AFS Description
 08-101 Dispatch
 08-102 Tac 1
 08-103 Tac 2

Holly Hill Police Talkgroups
 AFS Description
 08-061 Dispatch
 08-065 Talk

Holly Hill Fire Talkgroups
 AFS Description
 08-041 Dispatch

Lake Helen Police Talkgroups
 AFS Description
 12-081 Dispatch

New Smyrna Beach Police Talkgroups
 AFS Chan Description
 06-001 1 Dispatch
 06-002 2 Teletype
 06-003 3 Talkaround
 06-004 4 SPN
 06-005

New Smyrna Beach Fire Talkgroups
 AFS Description
 06-041 Dispatch
 06-051 Ops

Oak Hill Police Talkgroups
 AFS Description
 12-121 Dispatch

Orange City Police Talkgroups
 AFS Description
 05-061 Dispatch
 05-062

Orange City Fire Talkgroups
 AFS Description
 05-021 Dispatch
 05-022 Fireground
 05-023 Special Events

Ormond Beach Police Talkgroups
 AFS Description
 03-021 Dispatch
 03-022 Teletype
 03-026 Talk
 03-027 Car-to-car

Ormond Beach Fire Talkgroups
 AFS Description
 03-041 Dispatch
 03-061 Tac 1
 03-062 Tac 2
 03-063 Tac 3
 Ponce Inlet Police Talkgroups
 AFS Description
 04-081 Dispatch
 04-082 Car-to-car

Ponce Inlet Fire Talkgroups
 AFS Description
 04-101 Dispatch
 04-102 Fire 2

Port Orange Police Talkgroups
 AFS Description
 07-021 Dispatch
 07-022 Animal Control
 07-023 Car-to-car
 07-024 Tac 1
 07-025 Tac 2
 07-026 Special Events
 07-081 Detectives

Port Orange Fire Talkgroups
 AFS Description
 07-041 Dispatch
 07-044 Tac 1
 07-045 Tac 2

South Daytona Police Talkgroups
 AFS Chan Description
 05-081 1 Dispatch
 05-082 2 Tactical
 05-083 3 Car-to-car

South Daytona Fire Talkgroups
 AFS Description
 05-101 Dispatch

SEMINOLE COUNTY

Seminole is Florida's smallest county, which serves mostly as a suburb of Orlando. Seminole's principal city, Sanford, now has an international airport catering mainly to charter aircraft from Canada and Europe.

Seminole operates a Motorola TRS.

Seminole County Trunked Radio System
 Motorola Type II Analog (s0, s4, s4, s4, s4, s5, s12)

Frequencies
 851.3875
 851.4375
 855.4875
 856.2375
 856.4375
 856.4625
 857.2375
 857.4625
 857.9875
 858.2375
 858.4625

858.9875
 859.2375
 859.4625
 859.9875
 860.2375
 860.4625
 860.9625
 860.9875
 866.1125
 866.3625
 866.6125
 867.3875
 867.6375
 868.0375
 868.3125

Seminole County Sheriff's Office Talkgroups
 Talkgroup Chan Description
 600-1 A Patrol North Zones 1, 2, & 3
 600-2 B Teletype
 600-3 C Patrol South Zones 4 & 5
 600-4 D Patrol South Zones 6 & 7
 600-5 E Car/Car
 600-6 F
 600-7 G
 600-8 H
 600-9 I Longwood Police
 600-10 J
 600-11 K
 600-12 L
 600-13 M
 600-14 N
 600-15 O

Seminole County Fire-Rescue Talkgroups
 Talkgroup Description
 100-1 Dispatch
 100-2 Talk
 100-3 Fire Tac 1
 100-4 Fire Tac 2
 100-5 Fire Tac 3
 100-6 ICS 1
 100-7 ICS 2
 100-8 Winter Park Hospital
 100-9 Technical Services
 100-10 Emergency Services
 100-11 Columbia Park Medical Center
 100-12 South Seminole Community Hospital
 100-13 Florida Hospital Altamonte

Altamonte Springs Police Talkgroups
 Talkgroup Description
 000-2 Dispatch

Casselberry Police Talkgroups
 Talkgroup Description
 000-3 Dispatch

Lake Mary Police Talkgroups
 Talkgroup Description
 000-7 Dispatch

Sanford Police Talkgroups
 Talkgroup Description
 300-1 Patrol
 300-2 Patrol
 300-3
 300-4
 300-5
 300-6
 300-7
 300-8
 300-9

ORANGE COUNTY

Orlando, one of the most popular vacation destinations in the world, is the county seat and largest city of Orange County. Sea World and Universal Studios are within the Orlando city limits. Disney World is not. Disney operates its own private police force, but all major crimes are referred to the Orange County Sheriff's Office.

Orange County Trunked Radio System
 Motorola Type II Analog
 Primary System Frequencies
 857.4375
 858.4375
 859.4375
 860.4375
 866.0500
 866.1375
 866.1625
 866.3875
 866.4125
 866.6625
 866.6875
 866.8500
 866.8875
 866.9125
 867.1625
 867.3500
 867.5500
 867.6000
 867.8000
 867.8500
 868.1000
 868.1250
 868.2625
 868.2875
 868.5750
 868.6375
 868.8250
 868.8750

Winter Garden System Frequencies
 866.3125
 867.1375
 867.8875
 868.1375
 868.3500
 868.6000

Winter Park System Frequencies
 866.0875
 866.3375
 866.6375
 867.1875
 868.7500

Orlando System Frequencies
 866.1125
 866.2375
 866.3625
 866.5750
 866.6125
 866.7125
 866.7375
 867.0750
 867.2125

867.2375
867.3250
867.3875
867.6875
867.7125
867.7375
868.0375
868.2125
868.2375
868.3125
868.6625
868.7125
868.9125

Maitland System Frequencies
866.2000
866.5375
868.5250
868.7750

Orange County Jail System Frequencies
866.1625
866.8000
867.1000
867.4125

Talkgroup	Sector	Description
2576	1	Northwest Patrol
2608	1	Tac 1
2643	1	Teletype
2672	1	Car/Car
2704	1	Special Ops
2736	1	Service
2768	2	East Patrol
2800	2	Tac 2
2835	2	Teletype
2864	2	Car/Car
2896	2	Special Ops
2928	2	Service
2960	3	West Patrol
2992	3	Tac 3
3027	3	Teletype
3056	3	Car/Car
3088	3	Special Ops
3120	3	Service
3152	4	South Patrol
3184	4	Tac 4
3219	4	Teletype
3248	4	Car/Car
3280	4	Special Ops
3312	4	Service
3344	5	I-Drive/Disney Patrol
3376	5	Tac
3411	5	Teletype
3440	5	Car/Car
3472	5	Special Ops
3536		Admin 1
4080		SWAT

Talkgroup	Chan	Description
2096	Fire 1	Dispatch
2128	Fire 2	Unit-to-Unit
2160	Fire 3	East
2192	Fire 4	East Fireground
2224	Fire 5	South
2256	Fire 6	South Fireground
2288	Fire 7	North & West
2320	Fire 8	North & West
		Fireground
2352	Fire 9	Mutual Aid
2384	Fire 10	Mutual Aid with
		Osceola County
2416	Fire 11	Admin

2448	Fire 12	Inspections
2480	Fire 13	Supply
2312	Fire 14	Supervisors
2544	Fire 15	Unit-to-Unit

Talkgroup	Description
12048	Dispatch

Talkgroup	Description
11824	Tac 1
11856	Tac 2

Talkgroup	Description
14448	Tac 1
14480	Tac 2

Talkgroup	Description
8368	East Patrol
8208	East Teletype
8688	East Emergency
8304	West Patrol
8240	West Teletype
8272	West Emergency
8336	Central Patrol
8624	Central Teletype
8560	Central Emergency
8400	Car-to-car
8496	Watch Commanders
8528	Channel 11
8592	Channel 13
8656	Service
9264	Signal 43

Talkgroup	Chan	Description
8080	Tac 1	Dispatch
8112	Tac 2	Fireground
9104	Tac 3	Fireground
9136	Tac 4	Investigations
13328	Tac 7	

Talkgroup	Description
12592	Tac 1
12624	Tac 2

Talkgroup	Description
10448	Tac 1
10480	Tac 2
10512	Tac 3
10544	Tac 4

Talkgroup	Description
10672	Dispatch

Talkgroup	Description
4272	Orlando Regional Medical Center
4336	Sand Lake Hospital
4368	Florida Hospital Orlando
4400	Florida Hospital East
4432	Florida Hospital Apopka
4464	Columbia Park Hospital
4496	Health Central Hospital
4528	Princeton Hospital
4560	Winter Park Memorial Hospital
4816	Florida Kissimmee Hospital

POLK COUNTY

Polk is one of the largest counties in Florida. It's bounded by metro Tampa to the west and metro Orlando to the east. Bartow is the county seat and Lakeland the largest city. As Tampa and Orlando have grown, Polk has grown up with them. While a little off the beaten path, Cypress Gardens and Bok Tower Gardens remain worthwhile tourist destinations, especially to those hoping to escape the sometimes suffocating crowds of the major theme parks.

Lakeland has operated a Motorola TRS for years and very recently Polk County switched to a Motorola TRS.

Polk County Trunked Radio System
Motorola Type II Analog

Frostproof System Frequencies
866.1875
866.6000
868.1500
868.4000
868.8000

Indian Lakes System Frequencies
866.0750
866.3250
866.7750
867.5750

Lakeland System Frequencies
866.2750
866.6250
867.1250
867.3750
867.6250
867.7750
867.8250
868.0500
868.3250
868.5500
868.8500

Waverly System Frequencies
866.1000
866.3500
867.2750
867.8750

Talkgroup	Chan	Description
816	1	
848	2	
880	3	
912	4	
944	5	
976	6	
1008	7	
1040	Tac 1	
1072	Tac 2	
1104	Tac 3	

1136 Tac 4
1168 Tac 5
1200 Tac 6
1232 Tac 7
1264 Tac 8

Talkgroup	Chan	Description
2416	Fire	Dispatch
2448	Tac 2	
2480	Tac 3	
2512	Tac 4	
2544	Tac 5	
2576	Tac 6	
2640	Ops 1	
2672	Ops 2	
2704	Ops 3	
2736	Supervisors	
2768	Admin	

2608 EMS Dispatch

Talkgroup	Chan	Description
2800	1	Ops 1
2832	2	Supervisors
2864	3	Admin

Talkgroup	Description
33232	Dispatch
33264	Tac

Lakeland Trunked Radio System
System Frequencies
Motorola Type II Analog

Frequencies
852.3625
852.7125
853.7125
854.3625
854.7125
855.2375
855.7375
856.7625
857.7625
858.7625
859.7625
860.7625

Talkgroup	Chan	Description
816	1	North Dispatch
848	2	South Dispatch
880	3	Talk
912	4	Detectives
944	5	Information
1040	6	Undercover
1008	7	Teletype

Talkgroup	Chan	Description
1296	1	Dispatch
1328	2	Medical
1360	3	Fireground
1392	4	Admin
1424	5	Mutual Aid
1456	6	Airport Tower
1488	7	Airport Security

HILLSBOROUGH COUNTY

Tampa is the county seat and principal city of Hillsborough County. Hillsborough wraps around the eastern half of Tampa Bay and also includes the super structure section of the Sunshine Skyway Bridge that spans the mouth of Tampa Bay.

Popular sites in Hillsborough include Busch Gardens, Adventure Island, the Florida Aquarium, and Ybor City.

Tampa still relies on their tried and true conventional VHF and UHF radio systems. The county recently abandoned their VHF frequencies for an EDACS trunked radio system (TRS).

Hillsborough County TRS
Frequencies in LCN order
1=866.3750
2=866.7000
3=867.9125
4=868.2750
5=868.6000
6=868.8250
7=866.1250
8=866.4125
9=866.7250
10=866.2500
11=866.5625
12=866.8125
13=867.3125
14=868.2500
15=868.5750
16=867.0375
17=868.1000
18=868.3000
19=868.6875
20=867.6500

Talkgroups	Description
02-021	Dispatch District 1
02-022	Street Crimes District 1
02-023	Information District 1
02-041	Tac District 1
02-024	Dispatch District 2
02-025	Street Crimes District 2
02-026	Information District 2
02-042	Tac District 2
02-027	Dispatch District 3
02-030	Street Crimes District 3
02-031	Information District 3
02-042	Tac District 3
02-032	Dispatch District 4
02-033	Street Crimes District 4
02-034	Information District 4
02-044	Tac District 4
02-000	All Call
02-020	Patrol All Call
02-040	Tac All Call
02-045	Tac Information

Hillsborough County Fire/EMS			Frequencies
04-036	Dispatch		856.2375
04-000	All Call		856.4625
04-041	Tac 1		856.7375
04-042	Tac 2		856.9625
04-043	Tac 3		857.2375
04-044	Tac 4		857.4625
04-045	Tac 5		857.7375
05-001	EMS to Hospital		857.9625
15-156	Patch		858.2375

Tampa Police Department Radio System			Frequencies
Frequency	Channel	Usage	
453.550r	1	West Dispatch	858.7375
453.700r	2	East Dispatch	858.9625
453.800r	3	License & Warrant Checks	859.2375
453.850r	4	Emergency & Tactical	859.4625
453.750r	5	West Tactical	860.2375
453.875r	6	East Tactical	860.4625
453.400r		Tampa International Airport	860.7375
453.500r		Stadium & Special Events	866.0875
453.600r		Stadium & Special Events	866.3375
			866.5875
			867.0875
			868.1625
			868.4125
			868.6625
			868.9125

Tampa Fire-Rescue Department Radio System			Talkgroup	Chan
Frequency	Channel	Usage	Description	
154.430r	1	Dispatch	9088 A	Belleair Police
154.220r	2		9120 B	Belleair Police
153.830r	3		9024 A	Belleair Beach Police
			9056 B	Belleair Beach Police
			9920 A	Clearwater Police Patch
			9952 B	Clearwater Police Patch
			9312 A	Gulfport Police
			9344 B	Gulfport Police
			9440 A	Indian Shores Police
			9472 B	Indian Shores Police
			9568 A	Kenneth City Police
			9600 B	Kenneth City Police
			9696 1	Largo Police Dispatch
			9728 2	Largo Police Information
			9824 3	Largo Police Car-to-Car
			9760 4	Largo Police
			9792 5	Largo Police
			9856 6	Largo Police
			9888 7	Largo Police
			8768 1	Pinellas Park Police Dispatch
			8800 2	Pinellas Park Police Information

PINELLAS COUNTY

Pinellas lies along the western half of Tampa Bay. Clearwater serves as the county seat and St. Petersburg is the largest city. The Tampa Bay Devil Rays, a Major League Baseball team, play at the Tropicana Dome in downtown St. Pete. The main attraction of Pinellas is the miles and miles of white, sandy beaches and warm waters of the Gulf of Mexico.

Pinellas is home to three different trunked systems. The county operates a Motorola TRS that the Sheriff's Office and various cities use. St. Pete has its own Motorola TRS and Clearwater operates an EDACS TRS. Both St. Petersburg and Clearwater have talkgroups on the county system.

Pinellas County Trunked Radio System
Motorola Type II Analog

Talkgroup	Chan
9088 A	Belleair Police
9120 B	Belleair Police
9024 A	Belleair Beach Police
9056 B	Belleair Beach Police
9920 A	Clearwater Police Patch
9952 B	Clearwater Police Patch
9312 A	Gulfport Police
9344 B	Gulfport Police
9440 A	Indian Shores Police
9472 B	Indian Shores Police
9568 A	Kenneth City Police
9600 B	Kenneth City Police
9696 1	Largo Police Dispatch
9728 2	Largo Police Information
9824 3	Largo Police Car-to-Car
9760 4	Largo Police
9792 5	Largo Police
9856 6	Largo Police
9888 7	Largo Police
8768 1	Pinellas Park Police Dispatch
8800 2	Pinellas Park Police Information
8832 3	Pinellas Park Police Car-to-Car
8864 4	Pinellas Park Police
15232 A	St. Petersburg Police Secondary
15264 B	St. Petersburg Police Secondary
15296 C	St. Petersburg Police Secondary
15328 D	St. Petersburg Police Secondary
15360 E	St. Petersburg Police Secondary
10144 A	St. Pete Beach Police
10176 B	St. Pete Beach Police
8192 A	Tarpon Springs Police
8224 B	Tarpon Springs Police
10272 A	Treasure Island Police
10304 B	Treasure Island Police
8576 A	USF @ St. Petersburg Po-

8608 B	USF @ St. Petersburg Police
14912 1	Florida Highway Patrol
14944 2	Florida Highway Patrol
14976 3	Florida Highway Patrol
15008 4	Florida Highway Patrol Supervisors
16320 1	Florida Department of Law Enforcement

Clearwater Trunked Radio System

Frequency	LCN
854.9625	1
855.7125	2
855.9625	3
856.4375	4
857.4375	5
857.9875	6
858.4375	7
858.9875	8
859.4375	9
860.4375	10

Clearwater Police Talkgroups

AFS	Description
02-000	Agency Call
02-020	Patrol Fleet Call
02-021	West Dispatch
02-022	West Car-to-Car
02-023	East Dispatch
02-024	East Car-to-Car
02-025	Beach Dispatch
02-026	Information 2
02-027	Patrol Tac 2
02-030	Patrol Tac 3
02-031	Patrol Tac 4
02-045	No BOLO Tac 1
02-046	No BOLO Tac 2
02-047	No BOLO Tac 3
02-048	No BOLO Tac 4
02-085	LE 1 Patch
02-086	LE 2 Patch
02-087	LE 3 Patch
02-090	Pinellas County Sheriff's Office Patrol 3 Patch
02-091	Alpha Patch
02-092	Bravo Patch
15-143	Pinellas County TRS Patch
15-145	Pinellas County TRS Patch

St. Petersburg Trunked Radio System
Motorola Type III (s4, s11, s12, s12, s11)

Analog Frequencies

856.2125
856.7125
856.9325
857.2125
857.7125
857.9325
858.2125
858.7125
858.9325
859.2125
859.7125
859.9325
860.2125
860.7125
860.9325

St. Petersburg Police Talkgroups
Talkgroup Chan
Description

8224 1A	South Dispatch
8256 1B	North Dispatch
8288 1C	West Dispatch
8320 1D	Car-to-Car
8352 1E	Information
8384 1F	
8416 1G	
8448 1H	
8480 1I	Special Events 1
8512 1J	Special Events 2
8544 1K	Special Events 3
8576 1L	Special Events 4
8608 1M	Special Events 5
8640 1N	
8672 1O	
8704 2A	Tac 1
8736 2B	Tac 2
8768 2C	Tac 3
8800 2D	Tac 4
8832 2E	Tac 5
8864 2F	Tac 6

St. Petersburg Fire Department Talkgroups

Talkgroup	Chan
6416 2A	
6432 2B	
6448 2C	
6464 2D	
6480 2E	
6496 2F	
6512 2G	
6528 2H	
6544 2I	

STATEWIDE

Construction of the state's Motorola Astro TRS has halted and the state has chosen rival Com-Net

Ericsson. Motorola has asked the courts to help settle this issue. In the meantime state agencies such as FHP, FDLE, and the FFWCC have chosen to use local trunked systems or rely on their VHF systems a little while longer.

Florida Highway Patrol Radio System

Output	Input	Usage
154.665	155.505	Dispatch
154.695	155.460	Dispatch
155.565		Dispatch

Simplex Unit-to-Unit

Simplex Intercity

Florida Department of Law Enforcement Radio System

Output	Input	Chan	Usage
45.46	45.38	1	Dispatch
45.38	Simplex	2	
45.82	45.18	3	Dispatch
45.18	Simplex	4	
45.30	Simplex	5	Car-to-Car

Florida Fish & Wildlife Conservation Commission Radio System

Output	Input	Usage
45.00	44.96	Salt water enforcement
44.80		Simplex Unit-to-Unit
151.160		Fresh water & game enforcement
151.385		Fresh water & game enforcement
151.355		Simplex Unit-to-Unit

IT'S BACK AND BETTER THAN EVER

The Worldwide Shortwave Listening Guide
Edited by John Figlio

A "must" reference for every shortwave program listener!



KEEP YOUR C-BAND SYSTEM RUNNING STRONG!

Free Buyer's Guide

BEST VALUES ON...

- Receivers, including 4DTV
- Dish Movers & LNBs, all kinds
- Tune-up Kits, Tools & Parts
- Skypac® Programming
- Toll Free Technical Help



1010 Frontier Dr.
Fergus Falls, MN 56537

Fax: 218-739-4879
Int'l: 218-739-5231



800-543-3025
www.skyvision.com

Skyvision

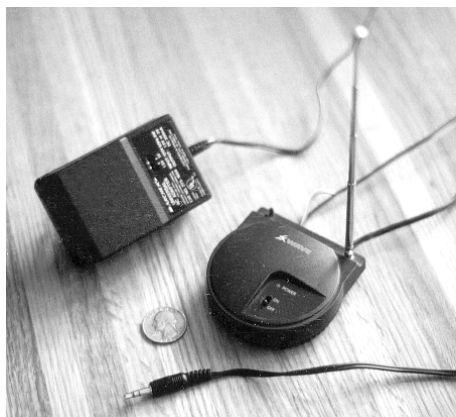
Beginner's Project: Wireless Whole House Audio

Nearly six years ago, in my *Satellite TV* column, I described how to distribute satellite audio throughout your house with the use of a small stereo FM transmitter. This is a great do-it-yourself project all SWLers, hams, and scanner listeners can really use. It's easy, it's cheap and you'll wonder why you hadn't thought of this before. So, now it's time to update this project and introduce it to the thousands of new *MT* readers who never saw the original piece.

◆ A Little Background

This whole project started many years ago when I was trying to listen to satellite delivered audio in different parts of the house. My only option was to run speaker wire to every room in the house attached to speakers with volume controls. The drawbacks were that the system was inflexible and would run into a lot of money, to say nothing of the arduous task of running wires through the attic and walls. I had to be able to do this without wires and cheaply.

Then came a catalog in the mail featuring a device to use in the car which broadcast the output of a personal CD player to the FM band of the car radio. A light went on in the attic! It was basically a battery powered miniature FM stereo transmitter with a small wire attached which would plug into the output of the CD player. It had a small six inch telescoping whip antenna, an on/off switch, and a tiny LED to indicate when the unit was on. Best of all, it cost less than \$20. It was perfect.



The original FM transmitter with its 3 volt AC adapter power supply. Look for units with telescoping whip antennas to give best coverage.

To use it in the house I slipped two AA batteries inside, attached an adapter to the plug so that it would fit into the output of the 1/4" headphone jack on front of the stereo amplifier I was using. Following the instructions which came with the unit I found a relatively unused frequency on the FM band, tuned the transmitter to that frequency and went around the house with a portable FM radio to see how reception was.

It worked like a champ. At the time I was listening to KILON-FM Long Beach, a public radio jazz station from California, on Galaxy 5 transponder 2, and sure enough there it was in each room. I walked outside and was surprised to be able to hear the little transmitter around the entire perimeter of the house. What a treat to be able to sit out on the deck with a portable radio and listen to KILON from a distance of three thousand miles!

◆ The Down Side

Not long after I put the transmitter into action, a serious problem developed: this little transmitter was power hungry. A new set of AA's wouldn't last two days on a 24 hour use basis and barely a week when judiciously turning the unit off when not in use. Because the battery drained fairly quickly, the transmitter tended to drift off frequency which made long term listening difficult because of having to adjust the radio's tuning to follow the drift of the transmitter.

The solution was an outboard power supply. The first one I tried lacked proper filtering which induced an annoying hum in the audio. The next one, with proper filtering, did the job. I'm happy to report that this little FM transmitter and power supply has been in continuous service for six years without incident. It's fun to listen to satellite delivered AC-3 audio from DMX Music/Direct on the Bose Wave radio via this little gem.

What's happened in the meantime has been the disappearance of these particular models. Many similar units are still available (some still under \$20), but in an effort to reduce production costs most no longer have an external antenna and, consequently, their range is dramatically reduced. After all, these units really need only transmit a few feet to be picked up by car radios. However, I've found that if you haunt the consumer electronics and major discount stores you'll find someone still selling a unit with an outside telescoping antenna. Circuit City

is one store which carries a brand which should work quite well for this project, and Radio Shack carries filtered adapters for the voltage required (see materials list below).

◆ Getting It All Together

In addition to your transmitter and power adapter you'll need two alligator clips with rubber covers and a 20-ft 1/8-in stereo headphone extension cord. To convert the transmitter to wall plug delivered DC, cut the plug off the end of the adapter (make sure it's not plugged into the wall), determine which of the two wires is positive (+); there may be a white stripe down the length of that wire. In the case of adapters without indicators you'll need to use a small Volt/Ohm meter to determine the polarity of each wire.

Separate the two wires and strip off a quarter inch of insulation on each lead. Slip the plastic alligator insulators down each of the wires and solder the bare wire ends to each of the clips. Stick a pencil into the squeezed open clips and slide the plastic insulator over the clips, remove the pencil.



Soldered alligator clips take the place of batteries and provide drift-free long term operation. Imagine the number of batteries I'd have gone through in the last six years!

Now, take the cover off the battery compartment on the transmitter and with a pen knife make a notch on the end of the cover where the adapter wire will feed into the battery compartment. Inside the battery compartment you'll see two terminals, one for negative (-) and one for positive (+). You may have to screw a very small screw into the terminals to make something the clip can bite into. Clip the alligator clips to the proper terminals, slip the battery cover back in place and plug it into an AC outlet. If there's an on/off switch and LED, turn the unit on and ascertain that it's operating.

Attach the transmitter's input plug to the female end of the 20-ft 1/8-in stereo headphone

extension cord and plug the male end into your audio source. Locate a quiet frequency on a portable FM radio and tune the transmitter (this is usually done with a screwdriver) until you hear the audio source coming through the portable FM radio. Tune the transmitter slowly because it's easy to zip right passed the listening frequency. These units are usually factory set at a predetermined frequency and most are not capable of transmitting across the entire FM broadcast band.



*Circuit City
Wireless
Sound Feeder/
Audio Adapter
Model SF 120.*

If you're satisfied that the transmitter is tuned properly make sure the antenna is pulled out as far as it will go and set the transmitter as high as you can on a shelf (that's the reason for the 20-foot headphone extension cord). I have mine at about the seven foot level.

As with all transmitters, the higher you place the transmitting antenna, the greater your coverage area. This is where the transmitters without external antennas don't work as well. Coverage is usually within only a few feet, making them useful only as CD adapters for the car. Still, if you're willing to do a little more work you may be able to get inside the unit and add an external antenna to improve coverage on units without antennas. That procedure is beyond the scope of this beginner's project.

◆ FM Listening Fun

This is a great way to be able to listen to your favorite shortwave radio programs any where in the house. I sometimes monitor the local 2 meter repeater this way. You can plug in your scanner, CD player, satellite audio – you name it! These units are FCC approved when used unmodified and provide just enough output to be heard within your own property. However, if you use this unit in a condo or apartment setting it's possible that your small signal can be picked up by others who may not be interested in listening. If your transmitter interferes with licensed broadcasters you'll have to shut it down. In most suburban settings these transmitters won't make it past your curb.

There are other FM transmitters, including kits* on the market, which would accomplish the same task, but I find these are considerably more expensive and require more expertise than most of us have. Besides, I like the off-the-shelf advantage this unit has: it's already built, it's

cheap (total project cost about \$50), very easy to put into operation, and has worked flawlessly for years. There aren't many electronic gadgets about which you can say the same thing!

◆ Materials for this project:

- Miniature FM Stereo transmitter with telescoping antenna: Circuit City Wireless sound feeder/audio adaptor from Arkon Resources, Inc. model # SF120 \$25. (<http://www.circuitcity.com>)
- AC adapter with hum filter: R. S. Cat. # 273-1752 (1.5 v) or #273-1755 (3 V) \$14.
- Headphone extension cord: R. S. Cat. # 42-2460 \$6
- Alligator clips: R.S. Cat. # 270-1545 \$3

*Advanced experimenters may want to try Rainbow Kits new FM Stereo Transmitter Kit which can be tuned from 76-108 MHz and claims a transmitting range of 200 feet. This product is available from your local Radio Shack store by special order or by mail order at 800-THE-SHACK. Cost is \$30 plus shipping and uses a 9v battery which is not included. This is not considered a "beginner's" project. Soldering skills and testing equipment are required.

Universal Video Descrambler

For Free Information Package and Pricing:
www.rcdistributing.com

R.C. Distributing Co. Phone (219) 233-3053 Fax (219) 289-1566

RadioMap™

Transmitter sites in your area are researched and marked on a beautiful 11 x 17 full color plot. See FCC licensed sites from VLF through microwave plus selected FAA transmitter sites. Callsigns, frequencies, and names provided. Ham radio stations excluded. You choose the map center location - anywhere within the United States. We adjust map coverage for best readability. Deluxe report includes additional index by frequency and local spectrum occupancy chart.

Used by radio professionals and hobbyists since 1994 for identifying towers, sources of radio signals, interference, etc. Send nearest street intersection for map center and check for \$29.95 or \$39.95 (Deluxe report) payable to Robert Parnass.

Robert S. Parnass, M.S.
Radio electronics consulting
2350 Douglas Rd., Oswego, IL 60543-9794
www.megsinet.com/parnass



by Larry Van Horn

This enormous frequency collection is every utility listener's dream, and it's now available as an up-to-date electronic file! Pages of informative text assist your listening tactics, followed by hundreds of accurate 30-420 MHz frequency listings, agencies, uses, and locations!

Tune in on practice bombing runs, fighter training, flight tests, air shows, military police, survival exercises, air-to-ground comms, disaster nets, command posts, and much more!

Select your favorite state(s), and we will e-mail you the most comprehensive and authoritative list of VHF/UHF military frequencies you have ever seen!

Only \$9⁹⁵ per state!
Order yours today!

Order SFT30 for only \$9.95 per state, or 3 states for only \$24.95!

PDF - YOUR ELECTRONIC MEDIA

**All 50 states
now available!**

GROVE

www.grove-ent.com

800-438-8155

828-837-9200 fax: 828-837-2216

7540 Highway 64 West
Brasstown, NC 28902

◆ Even More on Radar Speed Detectors

In a previous column, one of our readers suggested that frequency drift is self-canceling in police radar speed detectors. Bill Bowers disagrees, noting that the equation for determining speed is based on the actual frequency being transmitted. Bill does agree, however, that a slight drift would be inconsequential – an X-band radar gun would have to be 60 MHz off to produce even a 1% error!

◆ More on the NEXTEL “Walkie-Talkies”

In our previous column we expressed surprise that NEXTEL phones could be used as two-way hand-held transceivers. Responses from our readers were most interesting, including this information from sharp-eyed readers John Mayson and Butch Way:

Nextel uses Motorola iDEN radiotelephones running a maximum power of 600 milliwatts for the handhelds, and 3 watts for the base/mobile units. Each unit can be configured as a cell phone, a two-way radio, or both. They also have alpha paging and Internet capabilities, and operate in the 806-821 (handset)/851-866 (base) MHz range (non-cellular).

Nextel sites are linked by T1 telephone lines and cover several states (“corridors”); their digital modulation scheme is proprietary and trunk-tracking scanners cannot receive the transmissions. Their intercommunications range is limited to their service area, outside of which they are useless as a two-way radio. Like most digital communications, they’re either very clear and crisp, or totally inaudible.

Thanks, John and Butch, for this most informative look at the NEXTEL system.

Q. I use a discone in my attic for 800 MHz reception. I recently added a bag phone antenna in my radio room below; is it likely to have improved signal strengths? (Dave Macci, e-mail)

A. Nope. Since you already have a high discone, in order for you to enjoy another 3 dB gain (very small improvement), you would have had to add another discone (or equivalent antenna), spaced at least 1/2 wavelength apart (easy to do at 800 MHz) at the discone’s location or higher. Since all you added was a small whip at a lower and more shielded location in the residence, I doubt that you are getting more than 1 dB gain or so, if that. Not enough to count.

In fact, from certain directions, it’s likely that you are getting signal cancellation when the signal strikes the two antennas out of phase.

Q. I’m currently incarcerated in a federal prison which uses the new narrow-band trunking system. With a PRO-91 scanner, would I be able to hear their communications? (Name withheld)

A. Narrow band refers to the bandwidth required to convey the modulation (deviation) on the FM signal. Channels are now spaced at 12.5 kHz intervals in the federal UHF band, and while a scanner can be programmed for all those frequencies, your PRO-91 won’t track the 406-420 MHz trunking system, and even if it could – or if you manually scanned their channels – the Bureau of Prisons utilizes Digital Voice Privacy (DVP) on their new Motorola Astro systems, so all you’d hear would be noise.

Q. I am a football coach. Football in the South is holy and a coach must win however possible. During the game the opponent coaches talk from the sideline to the press box using a UHF digital phone conference call system; it’s spread spectrum and changes frequencies 90 times per second. Can I intercept this signal and convert the digital to audio for me to hear and give me the edge need to defeat this team? (Name withheld)

A. While I understand your fervor to intercept the calls, there are no digital-to-analog decoders in commerce because they would be illegal under the descrambler prohibitions of the 1986 Electronic Communications Privacy Act (ECPA ‘86).

Q. I just got back from a vacation in Orlando, Florida, and noticed while driving along I-95 and I-4 that there were motorist call boxes along the side of the interstate

every so many miles. Are these boxes telephones or are they two-way radios? If so, what frequency would they operate on and would they come under the privacy act about monitoring them? Do they connect direct with the Florida HP? (Morris, Wilmington, NC)

A. These call boxes are two-way, full-duplex radiotelephones operating in the 72 and 453 MHz ranges. They have been in place for nearly 30 years and communicate directly with communications consoles at Florida Highway Patrol stations. With the proliferation of CB radios and cell phones, they are rarely used nowadays. There are probably no laws against listening to them because they aren’t connected to a wireline service and they aren’t scrambled.

Q. I note that my old Yaesu FRG7 and FRG7000 receivers both have a “Wadley loop” design. I can’t find this in any of my electronics dictionaries; what is it? (Dick Kruse, Seattle, WA)

A. The very first portable, synthesized, short-wave receiver made for the consumer market was the XCR-30, made by the Barlow Wadley Company of South Africa in the early 1970s. It was a cutting-edge design by Dr. Trevor L. Wadley, using a phase-locked-loop (PLL) drift-canceling technique he developed during World War II. The receiver covered 500 kHz-30 MHz.

The first well-known commercial use of the Wadley loop was in the 1950s as implemented in the (British) Racal RA-17 receiver, followed by the RA-117 into the early ‘70s.

Questions or tips sent to Ask Bob, c/o MT are printed in this column as space permits. If you desire a prompt, personal reply, mail your questions along with a self-addressed stamped envelope (no telephone calls, please) in care of MT, or e-mail to bgrove@grove-ent.com. (Please include your name and address.) The current Ask Bob is now online at our website: www.grove-ent.com

Getting Started

Bright Ideas

Gary Webbenhurst

ab7ni@arrl.net

I recently bought the popular Radio Shack book, *Police Call 2001*. I thought I would pass along some tips and ideas for really getting your money's worth out of this fine publication. These ideas could be used in many other hobby reference books. Our Canadian and overseas readers must rely on other sources. I would be happy to publicize them if you'll send me the info.

14

I consult my *Police Call* book many, many times. This soft cover publication will soon fall apart if you do not take some precautions to protect the book. First, I bend back the front and back covers on the preformed spine line. I use scotch tape to reinforce the cover edges and along the spine. I then cut a clear plastic sheet protector and slide it over the front cover. Ditto for the back. Again, scotch tape will seal the deal.

15

Don't overlook the obvious. Read the inside front cover. Memorize the types of systems and types of radios: e.g., MOB (mobile or handheld radios) vs. MR (a repeater output). The EMS paramedic frequencies (462-463 MHz) at the bottom of this page are used throughout the U.S.; are they programmed into your scanner? Do you understand everything in the *Listening Guide* on pages 6-31? In fact, everything in the front of the book is worthy of reading (and rereading).

16

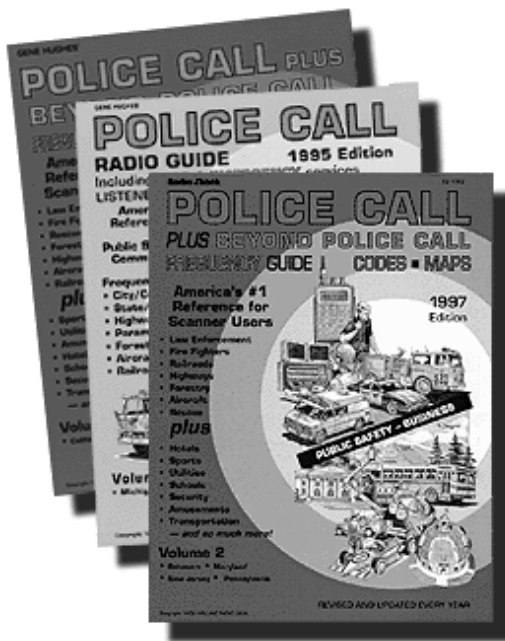
Learn how to decipher what you see when you look up your favorite agencies. Observe which frequencies share a common callsign. Often this shows one frequency as a MR or other repeater output. The other frequency with the same callsign is often the input and will have units under the MOB category.

This can also be a tie-in to other agency use. Look for all the frequencies that have the same number of MOB units. If the fire department has 50 mobiles on the "F" channels, look for the same number under other headings, especially the "L" listings.

I make a photocopy (just one for my own use) of the pages containing the info for my favorite agencies. On this photocopy, I draw lines from one frequency to others that are linked by virtue of a common callsign or number of MOBs. I literally "map" out the system in use.

17

In the past few years many agencies have migrated from low and high VHF to UHF or 800 MHz trunked systems. Who is using those old frequencies? They may still be in use by the original agencies. Example: the Brookings, South Dakota, Sheriff had long ago switched from 39 MHz to 453.600. Nevertheless, I was rewarded one night when I heard the deputies use the old 39.08 channel for car to car chitchat. Clearly, they had no idea anyone would still be listening on the old, almost forgotten frequency. They also moved the local ambulances over to the unused 39.100, even though it was licensed as a "P" frequency. California grabbed several of the 39 MHz channels for their updated CHP repeater system.



18

There are about a dozen key pages that I often use. For quick reference, I mark them with Post-It® Note/Flag markers. (The 3M pack # 673 TG1 is very handy!) I also use a fluorescent highlight pen if I find something interesting. You can also use the highlight pen to mark the outer edge of a page. I simply apply the pen to the very outside edge of the page and let the ink absorb into the page. A visual thumb shortcut!

19

I love to use *Police Call* to play the role of detective in my scanning activities. In the Spokane, WA, area, they use every available high band fire frequency from 153.755 to 154.445. Well, almost: Who is using 154.235 and 154.265? I have these plugged into the scanner but never hear a thing. They are licensed to nearby counties, and I can only guess they are used as simplex fire ground channels. The local fire frequencies are given names, e.g. Green, Blue, Red, etc. I have also heard reference to the "Gray" channel. Any Eastern Washington readers out there have a clue? I love this game: Always new challenges!

20

The "Frequencies listed by FCC Radio Service" can be interesting late night reading. Of special interest is the Automotive Emergency Radio listings. These 150 and 452 MHz frequencies have often been reassigned for public safety use. So where are the tow trucks? They might still use these, but many are now on "business" frequencies in the 461-469 range. See the next idea.

21

The "Beyond Police Call" can produce some gems. Look under the heading for Ambulances & Rescue Crews. College security/police departments can be found under the heading; College & Universities. This section is worthy of a page by page inspection. Oh yeah, those tow trucks are listed here, too.

22

If you have updates, corrections, or new information, please forward the info to the good folks at *Police Call*. Their regular mail and email address can be found on page 32.

23

If you live near a state line, you might have to travel to a nearby city to buy the correct version of *Police Call* for that region. Or, you can buy the CD version, which includes the info for all 48 states.

Next month, we take a look at tips and ideas to maximize your use of the *Police Call 2001* and other FCC database CD ROMs.

Michigan Monitoring

Jim Pavich writes: "I would like to share some scanner frequencies with you for your 'Scanning Report' department in *Monitoring Times*. Possibly some of your readers in the Michigan, Wisconsin, and Minnesota area would be interested. During the past 12 years I've been vacationing in the Upper Peninsula of Michigan. I have been scanning a variety of interesting stations across the U.P. from casino security to maximum security prisons. Most of my stops have been in the eastern, northern, and northwest part of the U.P. It is interesting listening to all of the action around the Mackinac Bridge and Mackinac Island... Scanning in the U.P. of Michigan has provided many hours of enjoyment over the past few years. Here is my list of stations:"

Eastern U.P./Northern L.P.

155.2500 Mackinac Island
453.9500 Mackinac Bridge
155.4900 Mackinac County Police
42.5800 State Police
42.7400 State Police
155.3100 Chippewa County Police
155.5350 Chippewa County Police
456.1000 Chippewa County Police (link?)
456.1750 Chippewa County Police (link?)
155.9100 St. Ignace Police
154.0550 St. Ignace Local Government
158.8500 St. Ignace Police
128.3250 Mackinac Area Flight Weather
460.5250 Mackinac Hospital
155.3400 Area Emergency (HEAR)
154.3100 Cheboygen County Fire
39.1400 Cheboygen, Petosky Police
39.4800 Cheboygen County Police
39.6800 Cheboygen, Petosky Police
39.8200 Cheboygen County Police
154.9500 Charlevoix County Police
159.0900 Lake City Police
155.6850 Emmet County Police
156.2100 Rogers City Police
155.5650 E. Jordan Police
155.7750 Sault Ste. Marie Police
155.4150 Sault Ste. Marie Police
155.7450 Newberry Police
463.9250 Casino Shuttle
154.5400 Casino Security

Munising, Marquette County

154.1000 Munising Police
42.5800 Munising State Police
155.4300 Ishpeming, Negaunee Twp., Champion Police

155.7150 Negaunee Police
155.9100 Marquette, Negaunee Police
155.7750 Marquette County Police
155.6100 Marquette County Police
154.9500 Dickenson County Police
42.2400 Marquette State Police
154.9800 Marquette County Local Government
155.1000 Marquette County Local Government

Baraga, Houghton, Keweenaw County

42.5800 State Police
42.7400 State Police
155.7600 Houghton Police
155.4150 Houghton, Keweenaw County Police
155.4900 Greenland Ontonagon County
155.0850 Baraga Prison
462.1375 Ojibwa Casino

Thanks, Jim.

◆ Final Preview of the BC780XLT

This is our final installment of our BC780XLT preview. By the time this article appears the BC780XLT will have been on the market for a while, so many of you will have reached your own conclusions about the radio. We would appreciate your passing on your comments to this editor (at scanmaster@aol.com) or the new scanner editor who will be starting in this post shortly.

This month we'll cover the Motorola trunking features of the radio. Uniden, of course, began the trunk-tracking phenomena in the mid-90s with the Bearcat 235 portable which tracked Motorola trunking. Since that time, they've followed up on their success with the introduction of the BC-895 base scanner and the BC-245 portable (which combine Motorola and Ericsson trunktracking). The BC-780XLT is another leap forward in Motorola trunktracking by Uniden for a number of reasons. Let's look at each new feature one at a time.

◆ Control Channel Trunking

This is perhaps the most significant and exciting new feature in the BC780XLT. In all previous trunking scanners you've been required to enter all the repeater output frequencies used in a Motorola trunked system in order to be able to monitor all the talkgroup communications therein. This scheme has worked very well and allows Uniden radios to present a real-time display of activity on the system

through the repeater-activity indicator bars.

On the other hand, there are problems with requiring all system channels to be programmed: First, if you don't know which working (voice) frequencies go with a particular control channel, you're out of luck. Most public safety systems have been fully vetted, so it hasn't been much of a problem. You can find information on all these systems on the web or in *Police Call*.

Business systems have been more of a problem. For several reasons it's actually fairly difficult to discern from the FCC databases how frequencies are comprised within a business trunked system. Furthermore, if any system adds frequencies, with the standard trunk-tracking method it would be difficult to determine that a new channel was added, not to mention what the actual channel is.

The BC-780XLT allows for standard control and voice channel programming of a Motorola system as well as for Control Channel Only trunking. In Control Channel (CC) only mode, the user need only program a Motorola control channel into memory and then set the bank for CC-only mode trunking through the Trunk Menu. Once you set the radio for normal trunk scan or search, the radio will look for a control channel in the appropriate bank (you can set it for up to 10 systems as you have 10 banks in the radio), lock on the control channel and begin trunking away. As the system switches to a voice channel as assigned by the control channel, you will actually see both a talkgroup number and the working channel frequency.

With this feature, you'll be able to determine all the working channels that correspond to the control channel. You can alpha tag talkgroups that are active during CC-only trunking, store them in Scan Lists, lock them out, assign fleet maps to Type 1 control channels, etc. You will not get a visual display through the trunking channel activity indicators, however, of system activity.

There is one new wrinkle to consider. While most systems will use what is known as the "default frequency plan," there will be some 800 MHz systems that do not. The "plan" refers to the scheme that is used to determine frequency assignments from the control channel. Depending on whether 12.5 kHz splits are used (as opposed to 25 kHz), and/or whether frequencies are used between 866 and 869

MHz, you will need to assign, through the Trunk Menu, the appropriate frequency plan. The BC780XLT owner's manual lays out how you make the determination. It's really simple and again, only will be necessary in limited cases.

A few other notes on control-channel only trunking: No plan will be needed for 900 MHz systems. CC-only trunking is not available for VHF and UHF systems. CC-only is not available for EDACS or LTR systems due to the nature of their operation (it's not a limitation of the scanner itself).

◆ VHF/UHF Trunking

Uniden has upgraded VHF and UHF trunking capabilities for the BC780XLT by providing for additional programming parameters as compared to the BC245XLT. When programming such systems you are asked in the 780 to program a base frequency, a spacing frequency and an offset channel. There are defaults for these settings and various web sites provide data for the few public safety and numerous federal and military VHF and UHF trunked systems which use settings other than the defaults. Uniden also goes one step further in allowing for the programming of up to three sets of base, spacing and offset frequencies (this will be critical in Australia where three sets are used and we're sure more U.S. systems will also have this requirement in the future). More spacing options are also available as well (any multiple of 5, 7.5 and 12.5 kHz).

◆ I-CALL

With the BC780XLT, you will, for the first time, be able to track I-CALL (otherwise known as "Private Call") communications in a trunked system between two radios. Most communications in a trunked system are "talkgroup" communications where, for example, a dispatcher communicates with a number of mobile units in the field. The dispatcher may only be addressing an individual unit, but all the units within the group monitor the conversation. In an I-CALL, one unit, such as a police sergeant may decide to contact an individual officer to discuss a recent event. The sergeant would enter the radio number of the unit he wishes to call and that communication will only be heard by the two units involved. The communication will trunk just like a talkgroup call, and the 780 will track it. Note that as discussed in a previous article, this feature is also available in Ericsson EDACS trunking.

There are a number of ways to operate I-CALL tracking on the 780:

A. I-CALL in Trunk Search Mode (settings are made through the Trunk Menu)

1. OFF: In search mode, the default setting is off. Here the 780 will perform just like other trunking scanners and will track only talkgroups.
2. ON: With I-CALLs set to "On" in Trunk Search, the scanner will track both talkgroup and I-CALL communications.
3. ONLY: In the I-CALL Only mode the scanner will search for

and follow all I-CALL communications found on the system (you can obviously only monitor one at a time). Talkgroups calls will be ignored. You can also enter this mode on the fly by pressing the decimal and then the search key at anytime.

Once you've begun to monitor an I-CALL you can press HOLD to follow the conversation. Usually (but not always), both individual unit IDs within the call will flip-flop back and forth on the screen. Sometimes only one of the IDs will appear, but you will hear both sides of the conversation.

B. I-CALL in Trunk Scan Mode

1. If you find a conversation that you like, or if you wish to monitor all the I-CALLs of a particular unit ID, you can enter that ID into Scan List memory. Individual unit IDs in Motorola trunktracking appear with a 7 as the first digit and they can be programmed into memory.
2. You can also program "All I-CALLs" into Scan List memory. To do this, step to an open Scan List memory position and enter either "decimal, 0" or you can enter (for Motorola) 700000. If you don't have over 90 talkgroups programmed into memory, we would suggest assigning Scan List 10 as your I-CALL List and then you can turn off "All I-CALLs" by deselecting a single scan list. With your scanner programmed in this manner, you can monitor your favorite talkgroups and follow all I-CALL communications at the same time.

One final note about Motorola I-CALLs. At times interconnect calls may slip through and appear as I-CALLs. Interconnect calls will not trunk. They of course are monitorable on any non-trunked scanner as well.

◆ Other Features

There are other aspects of Motorola

trunking which are interesting and which have been made available in prior Uniden-built scanners. These include the ability to "toggle the status bit" and the ability to change to using squelch as a command to return to the control channel. Neither of these features is critical and the default settings should suffice for almost all users.

◆ Alpha Tags, Scan Lists and More

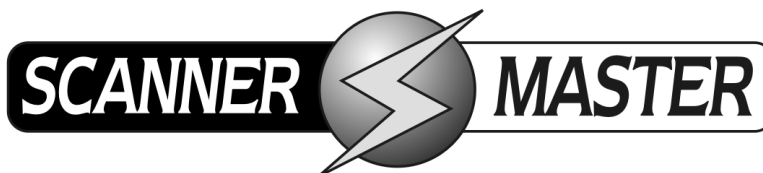
You can, of course, assign a 16-character alpha tag to any programmed talkgroup. Additionally, you can program a bank alpha tag which can be used to identify the trunked system programmed into a particular bank (this appears in Trunk Search mode). Furthermore, for Scan Mode, you can assign a Scan List tag to the 10 Scan Lists available per system (each of the 10 scan lists allows for up to 10 memory positions for a total of 100 per system). For example, you may wish to show:

Smithfield FD-1

Davis Cty. Fire

Besides alpha tagging a talkgroup, you can also flag any talkgroup in Scan List memory for a Beep Alert (a rapid triple beep will sound at the start of each transmission on the talkgroup to alert you to a conversation of interest). You can also flag any talkgroup in Scan List memory for external recording.

That wraps it up for our feature discussion of the Uniden Bearcat BC780XLT. For more information on this exciting new scanner, check out the official web site for the radio at <http://www.bc780xlt.com>.



www.scannermaster.com

**The all-new, all-purpose web site
for the serious scanner hobbyist.**

Managed by Rich Barnett, the Monitoring Times Scanner Editor.

Join our mailing list today:

Call 1-800-722-6701 or sign-up on our all new web site.

U.S. NOAA Weather Radio Stations and Frequencies

Courtesy of the National Weather Service

ALASKA

NWR Transmitter	Call	Freq	Watts	NWS Programming Office
Anchorage	KEC43	162.550	125	Anchorage
Biorka Island	WXJ80	162.550	500	Juneau
Cordova	WXJ79	162.400	500	Valdez
Craig	KXI80	162.475	300	Annette
Fairbanks	WXJ81	162.550	500	Fairbanks
Haines	WXM97	162.400	100	Juneau
Homer	WXJ24	162.400	800	Anchorage
Juneau	WXJ25	162.550	500	Juneau
Ketchikan	WXJ26	162.550	500	Annette
Kodi	WXJ78	162.550	100	Kodiak
Nome	WXJ62	162.550	500	Nome
Seward	KEC81	162.550	330	Anchorage
Soldotna	WWG39	162.475	300	Anchorage
Unalaska	WXK89	162.550	300	Anchorage
Valdez	WXJ63	162.550	500	Valdez
Whittier	KXI29	162.400	300	Anchorage
Wrangell	WXJ83	162.400	750	Juneau
Yakutat	WXK69	162.400	1000	Yakutat

ALABAMA

NWR Transmitter	Call	Freq	Watts	NWS Programming Office
Anniston	KIH58	162.475	1000	Birmingham
Auburn	WWF54	162.525	1000	Birmingham
Birmingham	KIH54	162.550	1000	Birmingham
Cullman	WWF66	162.450	100	Birmingham
Demopolis	WXL72	162.475	1000	Birmingham
Dozier	KIH59	162.550	800	Mobile
Florence	KIH57	162.475	1000	Birmingham
Ft. Payne	WWF44	162.500	1000	Birmingham
Huntsville	KIH20	162.400	1000	Birmingham
Jackson	WWF55	162.500	1000	Mobile
Louisville	KIH56	162.475	1000	Birmingham
Mobile	KEC61	162.550	1000	Mobile
Montgomery	KIH55	162.400	1000	Birmingham
Tuscaloosa	KIH60	162.400	1000	Birmingham
Winfield	WWF53	162.525	1000	Birmingham

ARKANSAS

NWR Transmitter	Call	Freq	Watts	NWS Programming Office
Fayetteville	WXJ52	162.475	1000	Tulsa
Fort Smith	WXJ50	162.550	1000	Tulsa
Gurdon	WXJ48	162.475	1000	Little Rock
Jonesboro	WXJ51	162.550	1000	Memphis
Little Rock	WXJ55	162.550	1000	Little Rock
Mountain View	WXL66	162.450	1000	Little Rock
Russellville	WWF96	162.525	1000	Little Rock
Star City	WXJ54	162.400	1000	Little Rock
Texarkana	WXJ49	162.550	1000	Shreveport
Yellville	WWG54	162.500	1000	Little Rock

ARIZONA

NWR Transmitter	Call	Freq	Watts	NWS Programming Office
Flagstaff	WXK76	162.400	100	Flagstaff
Gila County North	WWG41	162.425	100	Phoenix
Gila County South	WWG42	162.500	100	Phoenix

Grand Canyon	WWF52	162.475	100	Flagstaff
Greens Peak	KXI23	162.525	100	Flagstaff
Heliograph	KXI24	162.550	100	Tucson
Phoenix	KEC94	162.550	300	Phoenix
Prescott	WWF98	162.525	100	Flagstaff
Show Low	WXK76A	162.400	100	Flagstaff
Tucson	WXL30	162.400	100	Tucson
Window Rock	WWF99	162.550	100	Flagstaff
Yuma	WXL87	162.550	100	Phoenix

CALIFORNIA

NWR Transmitter	Call	Freq	Watts	NWS Programming Office
Bakersfield	WXL89	162.550	100	San Joaquin
Cochella	KIG78	162.400	100	San Diego
Eureka	KEC82	162.400	330	Eureka
Fresno	KIH62	162.400	330	San Joaquin
Grass Valley	WWF67	162.400	100	Sacramento
Los Angeles	KWO37	162.550	500	Los Angeles
Monterey	KEC49	162.550	100	San Francisco
Monterey Marine	WWF64	162.450	100	San Francisco
Pt. Arena/Ukiah	KIH30	162.550	500	Eureka
Redding	WXL88	162.550	100	Sacramento
Sacramento	KEC57	162.550	330	Sacramento
San Diego	KEC62	162.400	330	San Diego
San Francisco	KHB49	162.400	500	San Francisco
San Luis Obispo	KIH31	162.550	330	Los Angeles
Santa Ana	WWG21	162.450	100	San Diego
Santa Barbara Marine	WWF62	162.475	100	Los Angeles
Santa Barbara	KIH34	162.400	330	Los Angeles
Strawberry Peak	WXM66	162.500	100	San Diego

COLORADO

NWR Transmitter	Call	Freq	Watts	NWS Programming Office
Alamosa	WXM54	162.475	100	Pueblo
Bethune	WWF77	162.525	100	Goodland
Boyero	WWH32	162.450	100	Denver
Colorado Springs	WXM56	162.475	100	Pueblo
Denver	KEC76	162.550	330	Denver
Fort Collins	WXM92	162.450	100	Denver
Fowler	WWG44	162.425	100	Pueblo
Glenwood Springs	WWG43	162.500	100	Grand Junction
Grand Junction	WXM55	162.550	300	Grand Junction
Greeley	WXM50	162.400	100	Denver
La Junta	WWG23	162.500	100	Pueblo
Mead/Longmont	WXM51	162.475	100	Denver
Pueblo	WXM52	162.400	100	Pueblo
Sterling	WXM53	162.400	300	Denver
Wray	WXM87	162.475	100	Goodland

CONNECTICUT

NWR Transmitter	Call	Freq	Watts	NWS Programming Office
Hartford	WXJ41	162.475	300	Boston
Meriden	WXJ42	162.400	500	New York
New London	KHB47	162.550	500	New York

DELAWARE

NWR Transmitter	Call	Freq	Watts	NWS Programming Office
Lewes	WXJ94	162.550	500	Philadelphia

FLORIDA

NWR Transmitter	Call	Freq	Watts	NWS Programming Office
Belle Glade	WXM58	162.400	300	Miami
Bethlehem	WWH20	162.450	1000	Tallahassee
Daytona Beach	KIH26	162.400	1000	Melbourne
East Point	WWF86	162.500	250	Tallahassee
Fort Myers	WXK83	162.475	1000	Tampa Bay
Fort Pierce	WWF69	162.425	100	Melbourne
Gainesville	WXJ60	162.475	1000	Jacksonville
Inverness	WWF38	162.400	350	Tampa Bay
Jacksonville	KHB39	162.550	1000	Jacksonville
Key West	WXJ95	162.400	1000	Key West
Live Oak	WWG30	162.450	300	Jacksonville
Melbourne	WXJ70	162.550	1000	Melbourne
Miami	KHB34	162.550	1000	Miami
Naples	WWG92	162.525	1000	Miami
Ocala	WWF85	162.525	250	Jacksonville
Orlando	KIH63	162.475	1000	Tallahassee
Panama City	KG667	162.550	1000	Tallahassee
Pensacola	KEC88	162.400	500	Mobile
Salem	WWF88	162.425	1000	Tallahassee
Sebring	WXK83A	162.500	110	Tampa Bay
Tallahassee	KIH24	162.400	1000	Tallahassee
Tampa	KHB32	162.550	1000	Tampa
Tea Table Key	WWG60	162.450	125	Key West
Venice	WWG59	162.400	1000	Tampa Bay
West Palm Beach	KEC50	162.475	500	Miami

GEORGIA

NWR Transmitter	Call	Freq	Watts	NWS Programming Office
Americus	WXJ30	162.425	1000	Atlanta
Athens	WXK56	162.400	500	Atlanta
Atlanta	KEC80	162.550	500	Atlanta
Augusta	WXK54	162.550	500	Columbia
Baxley	WXM65	162.525	350	Jacksonville
Brasstown Bald	KXI22	162.500	100	Atlanta
Brunswick	WWH39	162.425	300	Jacksonville
Buchanan	WWH23	162.425	1000	Atlanta
Chatsworth	WXK52	162.400	200	Atlanta
Cleveland	WXJ53	162.525	300	Atlanta
Columbus	WXM32	162.400	1000	Birmingham
Jesup	WXJ28	162.450	300	Jacksonville
Macon	WXK71	162.475	1000	Atlanta
Metter	WWH25	162.425	1000	Charleston
Pelham	WXK53	162.550	500	Tallahassee
Savannah	KEC85	162.400	1000	Charleston
Sumerville	WXJ72	162.450	300	Atlanta
Thomaston	WXJ31	162.500	1000	Atlanta
Toccoa	WWH24	162.425	250	Greenville/Spartanburg
Valdosta	WXM79	162.500	100	Tallahassee
Waycross	WXK75	162.475	500	Jacksonville
Waynesboro	WXM88	162.425	375	Columbia

GUAM

NWR Transmitter	Call	Freq	Watts	NWS Programming Office
Guam (Nimitz Hill)	WXM85	162.400	375	Guam

(Continued Next Month)

Did your Antenna System Survive the Harsh Weather? Do Your Signals Seem a Little Weak?

It's Time to Upgrade Your Reception with These Fine Grove Products!



Grove OMNI II

Designed by Bob Grove, this exclusive Grove product offers 25-1300 MHz coverage; lightweight, compact design, high performance, and low cost! Designed especially for wide-area metropolitan listeners, the 68" Omni can be mounted on a mast, in an attic crawl space, against a wall—just about anywhere convenient.

BONUS FEATURE! Although the Omni is essentially non-directional, a metal mast gives it useful directional properties. Overload interference from paging transmitters, weather stations, FM or TV broadcasters, or other sources may be reduced or eliminated when positioning the antenna on the mast at the time of installation! Similarly, a distant, weak signal may be peaked by the same technique!

Balun transformer with F connector, offset pipe, mounting hardware and full instructions included.

Order ANT 5

\$29.95

includes shipping
in the US

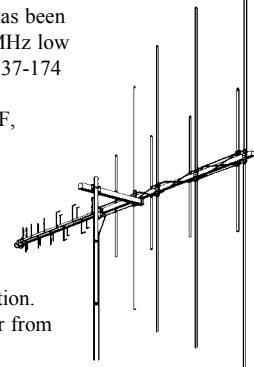
SCANNER BEAM

Our world-renowned Scanner Beam has been improved to provide unexcelled 30-50 MHz low band reception, 108-137 MHz aircraft, 137-174 MHz high band, 225-400 MHz military aircraft and satellites, 406-512 MHz UHF, and 806-960 MHz microwave mobile.

HAMS NOTE—can be used for transmitting up to 50 watts on 144, 220, and 420 MHz bands. 50/75 ohms nominal impedance.

May be used with inexpensive TV antenna rotator or fixed in favored direction. Local signals still come in loud and clear from all directions.

Balun transformer, offset pipe and all mounting hardware included (requires TV type F connector on your coax). Approximate size 8'H x 5'W.



Order ANT 1

\$74.95

includes shipping
in the US

THE SCANTENNA

This omnidirectional scanner antenna will equal or outperform any competitor on the market. Its dipole-cluster design utilizes broadband techniques to provide continuous frequency coverage from 25-1300 MHz, offering superb reception of public safety, civilian and military aircraft, hams, personal communication devices, maritime, CB—anything in its frequency range!

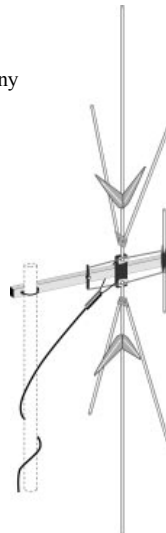
Approximate size 7-1/2'H x 4-1/2'W.

SPECIAL: Now includes 50' of coax cable plus Motorola and BNC connectors!

ORDER ANT 07

\$54.95

includes shipping
in the US



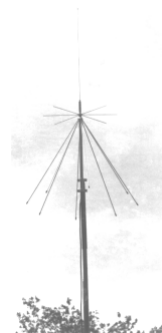
Professional Wideband Discone

The discone antenna is used by government and military agencies worldwide because of its wide bandwidth characteristics and non-directional coverage. Now Diamond offers a professional grade discone at a popular price.

Designed for use with wide-frequency coverage VHF/UHF scanners and receivers, the Diamond D130J discone consists of 16 rugged, stainless steel elements and is capable of transmitting up to 200 watts in the amateur 50, 144, 220, 432, 900, and 1200 MHz bands.

As a receiving antenna, the D130J is omnidirectional for continuous 25-1000 MHz (and above) coverage. A base-loaded, vertical top element is used as a low band (30-50 MHz) frequency extender.

The elements are arranged on a 24-inch support pipe equipped with two strong mounting brackets to accommodate any standard mast-pipe (1" to 2-1/8" diameter).



Order ANT 9

\$99.95

includes shipping
in the US

GROVE

GROVE ENTERPRISES, INC.

1-800-438-8155 US and Canada;
828-837-9200; FAX 828-837-2216

7540 Highway 64 West
Brasstown, NC 28902-0098
email: order@grove-ent.com

web: www.grove-ent.com

**Call
Today!**

Additional Products

• CBL 50	50' RG-6U	\$19.95
• CBL 100	100' RG-6U	\$24.95

includes shipping in the US

US Air Force Global HF System

The United States Air Force operates the busiest military radio system on high frequency "shortwave," the band between 3 and 30 megahertz (MHz). It's GHFS, the Global High Frequency System. It serves a wide number of military stations, most using upper-sideband (USB) voice.

◆ History and Mission

GHFS was born on June 1, 1992, when the Air Force consolidated its HF radio networks. Most of it came from the "Giant Talk" net used by the disbanded Strategic Air Command, and from the servicewide Global Command and Control System (GCCS).

The resulting GHFS went through some minor, evolutionary changes. It never changed its mission, however. This is still published regularly by the US Department of Defense (DoD) in its *Flight Information Handbook*:

"The US Air Force Global High Frequency System is a worldwide network of 13 high-power HF stations, which provide air/ground HF command and control radio communications between ground agencies and US military aircraft and ships. Allied military and other aircraft are also provided support in accordance with agreements and international protocols as appropriate. The USAF Global HF System is not dedicated to any service or command, but supports all authorized users on a traffic precedence basis."

"General services provided by the Global HF System are general Phone Patch and Message Relay Services, HF Radio Teletype (HF RTTY) and Data Support, Command and Control Mission Following, Emergency Support, Broadcasts, HF Direction Finding Assistance, and ATC support."

GHFS can be a real catch-all. Authorized users come from all US military branches, and occasionally from other nations and alliances which have made agreements for service. The US Navy has abandoned its old High Command (HICOM) net for Global, and the Army is occasionally heard as well. Army landing craft and barges are especially good catches.

By far the heaviest users, though, are transports and air-refueling tankers in the Air Mobility Command (AMC). The transports usually identify with the static callword "Reach," as in "Global Reach," plus a tail or mission number. It's very common for Reach aircraft to make phone patches to weather and operations offices

for arrival arrangements and general safety of flight.

The RTTY they mention used to be common, but this requirement has very recently been dropped as unsupportable, and digital modems will take over. The "Broadcasts" mentioned are EAM, the high-priority "Emergency Action Messages" that send coded orders throughout the US military on all channels. On GHFS, these usually have a 6-character preamble, and the word "standby."

"Direction finding" refers to an emergency procedure of calling up a locating station to "fix" the location of a lost aircraft or a jammer, and "ATC support" refers to Air Traffic Control, also an emergency relay procedure. Under all normal conditions, military flights use the same civil ATC nets as scheduled airliners.

◆ Frequencies and Calls

GHFS frequencies are in two groups: published and discrete. Published frequencies are the big calling channels, currently 4724, 6712, 6739, 8992, 9025, 11175, 11181, 13200, 13212, and 15016 kilohertz (kHz), nearly always upper-sideband voice (USB). Busiest are 8992 ("Eight-Niner") and 11175 ("Triple-1"), which most stations guard around the clock. The others operate on a schedule which changes twice yearly, on the first of April and October.

9025, 11181, and 13212 kHz are relatively new frequencies, guarded only by Lajes, a station in the Azores Islands west of Portugal. That bleeping on 9025 is Automatic Link Establishment (ALE), a computerized system that simplifies HF operation. Old frequency lists will show 8968 and 17976, but these were removed from GHFS service two years ago.

The general callword "Mainsail" is used by stations entering this net, as an all-stations or "CQ" call. Recently, some GHFS stations changed names, though voice callsigns haven't caught up yet. "Andersen" is now "Guam." "McClellan," near Sacramento, CA, is "West Coast." DoD publications are vague on Hickam, near Honolulu, sometimes calling it "Hawaii." For a few months after Andrews Air Force Base, MD, became a remote control point, these local identifiers all vanished, but they have since come back.

The Air Force Eastern Test Range network, which becomes busy during missile and Space Shuttle launches from Cape Canaveral, is considered a GHFS backup. Cape Radio can be

heard on its primary frequency of 10780 kHz, and a newly listed secondary of 20390.

Global stations also maintain a large number of "discrete" frequencies, where traffic will be moved for lengthy communications. There are a lot of these. Fortunately, the frequency and possibly a secondary will be given over the air when the ground station sends somebody there.

◆ Modernization

Much has been made of Scope Command, the huge Air Force program to update all equipment used by GHFS and others. It has been repeated in the hobby press that this plan somehow replaces GHFS, or merges it into a huge net with all the other high-power services. While Scope Command will definitely affect the way we listen to the Air Force, neither of these statements is true. All of these nets continue their present identities and missions.

Scope Command is designed to standardize all of the Air Force's far-flung HF stations into something that can finally be supported cheaply and effectively with off-the-shelf components. The acronym "Scope" stands for "System Capable Of Planned Expansion." "Command" refers to the merger of several earlier schemes, such as "Scope Signal" and "Scope Control" into one big plan.

The "Planned Expansion" has been going on in phases since the initial \$350 million contract went to Rockwell/Collins in 1995. Currently, "Phase 1" is complete, giving all GHFS stations new, authoritative-sounding radios with many advanced bells and whistles. "Phase 2" is due for completion sometime after 2002. At that time, the entire Global will be remotely controlled from a new facility, the Centralized Net Control Station (CNCS) at Andrews Air Force Base in Maryland.

This remote capability, called "Lights Out" in Air Force jargon, moves most of the human operation of the Global to Andrews. Already, we have heard Croughton Global, in England, stand-down its radio watch amid great ceremony and publicity. However, smaller staffs remain at all these stations for maintenance and occasional local operation. They're not going away either.

◆ Advanced Uses

Scope Command has gotten bigger a couple of times, mostly at the hands of the Air Mobility Command, which currently is not only the

system's major user but its primary installer. The first large addition was the Automatic Link Establishment capability. The goal here was and is to make HF phone patches as simple and automatic as dialing through a satellite, but at a far lower cost. Designers talk fondly of "God-Furnished Equipment," namely the ionosphere.

ALE doesn't replace GHFS either, but it does change it somewhat, adding a whole new set of frequencies, capabilities, and acronyms for utility fans to learn. It is perhaps the most complicated communication system ever devised, coming from a military standard many hundreds of pages long. However, a lot of work has gone into making it completely transparent to the user, not to mention kind of fun.

What we hear is a distinctive gurgling sound, sometimes followed by phone calls or voice traffic on the same frequency. The ALE part can be decoded by PC-ALE, a freeware program for IBM/Windows compatible computers. It's not hard to build up nice logs from the "soundings" made by Global stations and aircraft as they automatically update their internal databases of the best calling channels for one another.

More recently, the AMC asked for, and got, four million dollars to add an HF e-mail system to Scope Command. This is, potentially, another big money saver. It allows computers to "inject" files into NIPRNET, the DoD's Non-Classified Internet Protocol Router Network. Ultimately, file transfers will go from "desktop to cockpit," saving yet more satellite time.

We end this month's column with a correction from January. The National Hurricane Center's international weather identifier is, of course, KNHC, not KHNC. Don't know how that one got by. See you next month, back with the usual big log.

Global High Frequency System Schedule

(Revised December 2000)

H24: Continuous

S: Summer (April-September)

W: Winter (October-March)

Frequencies are kHz, Times are UTC (Coordinated Universal Time).

4724

Andrews (S 0430-0930, W 0200-1230)
 Ascension (S 2400-0700, W 2400-0700)
 Croughion (S 2230-0400, W 1800-0800)
 Elmendorf (S 1000-1300, W 0230-1900)
 Guam (S 1300-2000, W 1200-2030)
 Hickam (S 0900-1600, W 0800-1700)
 Incirlik (H24)
 Lajes (S 2230-0400, W 1800-0800)
 Offutt (S 0600-1100, W 0300-1400)
 Salinas (S 0300-1000, W 0200-1100)
 Thule (W only H24)
 West Coast (S 0730-1300, W 0500-1530)
 Yokota (S 1200-1930, W 0930-2200)

6712

Andrews (S only 0230-0930)
 Ascension (S 2400-0700, W 2400-0700)
 Croughion (S only 2230-0400)
 Guam (W only 2400-1230)
 Lajes (S 2230-0400, W 1800-0800)

6739

Ascension (1900-2400)
 Elmendorf (S 0800-1400, W 0030-2130)
 Guam (S 1100-2000, W 1000-2030)
 Hickam (S 0700-1600, W 0600-1700)
 Incirlik (H24)
 Salinas (S 0100-1000, W 2400-1100)
 Offutt (S 0400-1100, W 0100-1400)
 Thule (W only H24)
 West Coast (S 0530-1300, S 0300-1530)
 Yokota (S 1000-2130, W 0730-2400)

8992

Andrews (H24)
 Ascension (H24)
 Croughion (H24)
 Elmendorf (H24)
 Guam (H24)
 Hickam (H24)
 Offutt (H24)
 Salinas (H24)
 Thule (H24)
 West Coast (H24)
 Yokota (H24)

9025

Lajes (S 2230-0400, W 1800-0800)

10780

AF Eastern Test Range:
 Cape Canaveral
 Antigua
 Ascension

11175

Andrews (H24)
 Ascension (H24)
 Croughion (H24)
 Elmendorf (H24)
 Guam (H24)
 Hickam (H24)
 Incirlik (H24)
 Salinas (H24)
 Offutt (H24)
 Thule (H24)
 West Coast (H24)
 Yokota (H24)

11181

Lajes (S 0400-2230, W 0800-1800)

13200

Andrews (S 0930-0430, W 1230-0200)
 Croughion (S 0400-2230, W 0800-1800)
 Elmendorf (S 1300-1000, W 0800-1800)
 Guam (S 2000-1300, W 2030-1200)
 Hickam (S 1600-0900, W 1700-0800)
 Offutt (S 1100-0600, W 1400-0300)
 Salinas (S 1000-0300, W 1100-0200)
 Thule (S H24)
 West Coast (S 1300-0730, W 1530-0500)
 Yokota (S 1930-1200, W 2200-0930)

13212

Lajes (S 0400-2230, W 0800-1800)

15016

Andrews (S 0930-0230, W 1230-2400)
 Ascension (0700-1900)
 Croughion (S 0400-2230, W 0800-1800)

Elmendorf (S 1400-0800, W 0800-1800)
 Guam (S 2000-1100, W 2030-1000)
 Hickam (S 1600-0700, W 1700-0600)
 Incirlik (H24)
 Lajes (S 0400-2230, W 0800-1800)
 Offutt (S 1100-0400, W 1400-0100)
 Salinas (S 1000-0100, W 1100-2400)
 Thule (S only H24)
 West Coast (S 1300-0530, W 1530-0300)
 Yokota (S 2130-1000, W 2400-0730)

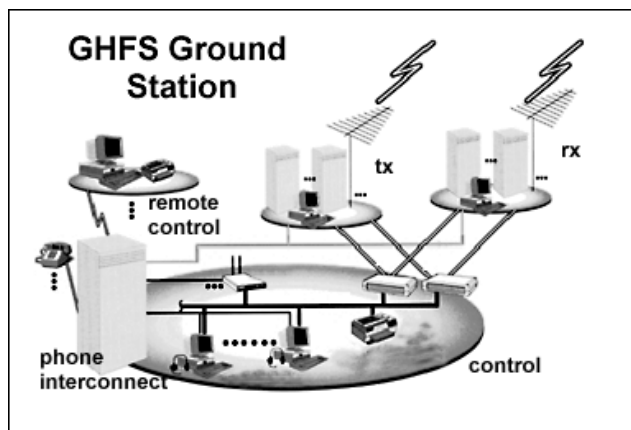
20390

AF Eastern Test Range:
 Cape Canaveral
 Antigua
 Ascension

GHFS Ground Stations

(AFB = Air Force Base, AB = Air Base)

Voice Identifier	ALE	Location
Andersen	GUA	Andersen AB, Guam
Andrews	ADW	Andrews AFB, MD
Ascension	HAW	Ascension AB, S. Atlantic
Croughion	CRO	Croughion AB, England
Elmendorf	AED	Elmendorf AFB, AK
Hickam	HIK	Hickam AFB, HI
Incirlik	TAG	Incirlik AB, Turkey
Lajes	PLA	Lajes Field, Azores
McClellan	MCC	Near Sacramento, CA
Offutt	OFF	Offutt AFB, NE
Salinas	JNR	Salinas, Puerto Rico
Thule	GTL	Thule AB, Greenland
Yokota	JTY	Yokota AB, Japan



Additional ALE Ground Stations in Network:

GVT E-Systems Test Facility, Greenville TX
 JDG Naval Support Facility Diego Garcia, Indian Ocean
 OKC Tinker AFB, OK
 OKV Civil Air Patrol, Winchester, VA
 RIC Civil Air Patrol Tech Center, Richmond, VA
 RSC Rockwell/Collins Service Center, Dallas, TX
 WRL Warner-Robins AFB, GA

ALE Scan Frequencies

(kHz, all USB)

2805.0	3059.0	3137.0	4721.0	5708.0
6715.0	6721.0	7632.0	8965.0	9025.0
9057.0	11226.0	11250.0	13215.0	15043.0
18003.0	20631.0	23337.0	27870.0	

ABBREVIATIONS USED IN THIS COLUMN

ALE	Automatic Link Establishment
AM	Amplitude Modulation
ARQ	Automatic Repeat Request teleprinting system
CAMSLANT	Communication Area Master Station, Atlantic
CIA	US Central Intelligence Agency
CW	Continuous Wave (Morse telegraphy)
DX	Distant Transmitter
E5	CIA English female "numbers," counts 1-0
E10a	Israeli English "numbers" with "2" in callup
EAM	Emergency Action Message
FAX	Radiofacsimile
FEC	Forward Error Correction teleprinting system
FEMA	Federal Emergency Management Agency
ID	Identifier
M8	Cuban CW "numbers," ANDUWRIGMT for 1-0
MARS	Military Affiliate Radio System
Pactor	Packet Teleprinting Over Radio
PR	Puerto Rico
RSA	Republic of South Africa
RTTY	Radio Teletype
SHARES	Shared Resources
UK	United Kingdom
Unid	Unidentified
US	United States

All transmissions are USB (upper sideband) unless otherwise indicated. All frequencies are in kHz (kilohertz) and all times are UTC (Coordinated Universal Time). "Numbers" stations (encrypted, usually unidentified, broadcasts thought to be intelligence-related) are identified in () with their ENIGMA station designators, as issued by the European Numbers Intelligence Gathering and Monitoring Association (*see feature article in this issue*).

- 1888.0 IPD-Civitavecchia Radio, Italy, with weather in Italian at 1910. (Patrice Privat-France)
- 1890.0 TFA-Reykjavik Radio, Iceland, with a phone patch at 2240. (Privat-France)
- 2600.0 IQQ-Mazara del Valla Radio, Italy, with a weird English computer voice followed by weather in Italian, at 0147. (Ary Boender-Netherlands)
- 2810.0 OFK-Turku Radio, Finland, with navigational warnings at 2240. (Boender-Netherlands)
- 3299.0 YCLR- Probably Ukrainian military, with CW callup to "HNBG," then traffic, at 2052. (Boender-Netherlands)
- 4215.5 OXZ-Lyngby Radio, Denmark, with FEC traffic list, then announcement that this telex service would close on 31 December, at 2330. (Day Watson-UK)
- 4426.0 CAMSLANT-US Coast Guard, VA, working cutter *Vigorous*, at 1807. (Duke Rumley-NC)
- 4555.0 Unid-Top frequency of 1-per-second pulsed carrier sweeping up from 4567, at 0126. (Tom Severt-KS) [This is one of several US experimental oceanic observing sensors. The users are aware that they have an interference problem. -Hugh]
- 5170.0 SYN-Israeli Intelligence (E10a) with abnormal callup NR2ZEC5 for hours, changed to SYN2 at 0325, then SYN2 at 0330 (John Maky-AR)
- 5230.0 CIO8-Israeli Intelligence (E10a), abnormal callup repeated for hours after 0145. (Maky-AR)
- 5399.6 GANTSEC-US Coast Guard, Greater Antilles Section, PR, working stations on this new frequency, also some scrambling heard, at 0232. (Ron Perron-MD)
- 5403.0 AAR3NAA-US Army MARS, DE, appointing a MARS Region 3 representative to contact FEMA on 5211 and 10493, at 1514. (Perron-MD)
- 5418.0 English female "numbers" voice, callup "506" at 0200, then into repeated 5-number groups at 0210. (Camillo Castillo-Panama) [Probably Russian and transmitted from Cuba. -Hugh]
- 5696.0 Coast Guard Rescue 2131, telling CAMSLANT they see a strobe in the water, at 2131 (Rick Baker-MI)

- 5800.0 Sled Dog-US Military, working Sun Burst at 0553 (Jeff Haverlah-TX)
- 5810.0 CIA "Counting Station" English format (E5), AM callup to "204," several days at 0200. Same station, with AM callups to "400," two different days at 0300. Same station, AM callup to "132," at 0301. (Castillo-Panama)
- 5841.0 Herk 17-US Coast Guard HC-130, calling Panther on the "Bravo" frequency, no joy, at 2326. (Perron-MD)
- 6449.7 PWX33-Brazilian Navy, Brasilia, with RTTY warnings at 0422. (Bob Hall-RSA)
- 6671.0 Lifter 99-US Air Force C-17, calling Turbo 82, a tanker, no joy at 0018. (Perron-MD)
- 6881.0 NNNOMUA-US Navy/Marine Corps MARS, in a Pactor message system with NNNOWPT at 2128. (Mid-Atlantic DXer-MD)
- 7470.0 VLM-Casey Meteorological, Antarctica, with weather FAX (120/576) at 1901 and 2251. (Watson-UK)
- 7635.0 High Voltage-Net control in probable US Marine Corps exercise, working Lancer 03 and Fighting Tiger 202, at 2030. (Rumley-NC) Chieftain-Probably the same exercise, having a squabble with Head Cap 46 and 49, US Civil Air Patrol, over whose frequency it was. Finally Head Cap 45 showed and canceled that day's CAP Chaplains' Net, at 2200. (Perron-MD)
- 7664.0 RIW-Russian Navy, trading CW signal reports with CMU967, at 2026. (Boender-Netherlands)
- 7685.5 Unid-US Navy/Marine Corps MARS, Pactor traffic list at 2200. (MADX-MD)
- 7784.0 Unid RTTY relay of US Air Force KAWN, Aviation Weather Network, at 0030. (Severt-KS)
- 7844.0 Khabarovsk Meteorological, Russia, synoptic weather chart FAX (60/576), at 0736. (Watson-UK)
- 8167.0 TWA 891-Trans World Airlines flight, patching Maintenance via Stockholm to report a right-side hydraulic failure, at 2340. (MADX-MD)
- 8400.0 Padilla3-Colombian Navy vessel, ALE sounding at 0329. (MADX-MD)
- 8980.0 US Coast Guard 1717, in a patch via CAMSLANT to Panther (Bahamas anti-drug), went back to primary 8983, at 2311. (Perron-MD)
- 8983.0 US Coast Guard Rescue 1720, reporting a distressed vessel at 2213. "D-3-F"-US Coast Guard aircraft on probable drug operation, working CAMSLANT at 2300. (Perron-MD)
- 8992.0 Misnamer-US Military with EAM, simulcast on 11244, at 1906. (Haverlah-TX)
- 9025.0 Lajes-US Air Force, Azores Islands, North Atlantic Ocean, with an EAM on their new Global frequency, at 0224. (Perron-MD)
- 9153.0 Cuban cut number station (M8), CW callups and 5-figure groups, three different Saturdays at 1203. (Castillo-Panama)
- 10608.0 Atlantico, Colombian Navy headquarters, calling vessel *Espada*, in ALE at 2327. (MADX-MD)
- 11175.0 Zapper 21-US Military, calling Bookshelf, no joy at 1758. (Haverlah-TX)
- 11200.0 Milole-Gabon Railways, Africa, ALE sounding at 1610. Mboungou-Gabon Railways, ALE sounding at 1631. (Watson-UK)
- 11250.0 Andrews-US Air Force, MD, working Offutt, NE, in voice and ALE at 1351. (Perron-MD)
- 12481.5 ELYC9-Vessel Navigator *Saturn*, working VIP76 in ARQ, at 1040. (Watson-UK)
- 12584.0 VIP76-Globe Wireless, Perth, Australia, working vessel Navigator *Saturn* in ARQ, at 1040. (Watson-UK)
- 13530.0 CESYP- Colombian Navy Special Command, working CALDAS33 in ALE and voice, at 1742. (MADX-MD)
- 14396.5 AFA3HY: SHARES Coordination Station, KS, taking weekly check-ins at 1700, switching to ALE at 1709. (MADX-MD)
- 14481.7 Rffbbpm-French Military, Paris, with ARQ messages to Rfgwda and many others, at 1600. (Hall-RSA)
- 16806.5 NRV-US Coast Guard, Guam, with FEC weather at 1545. (Hall-RSA)
- 17080.0 UAI3-Nakhoda Radio, Siberia, Russia, with CW markers at 2227. (Ken Maltz-NY)
- 17441.5 5YE-Nairobi, Kenya, with RTTY weather at 2210. (Maltz-NY)
- 19131.0 Atlas-US Drug Enforcement Agency, IA, working aircraft "411" at 1930. (MADX-MD)
- 19530.2 FJY2-French government, Port-aux-Francais, Kerguelen Islands, with RTTY "fox" markers at 1735. (Maltz-NY)
- 20179.8 Rfviflr-French Navy frigate *Floreal*, with ARQ messages to Rfvic and many others, at 1625. (Hall-RSA)
- 22550.2 MGJ-Royal Navy, Faslane, UK, with channel status messages in RTTY at 1620. (Maltz-NY)

HF Fax Facts

Unlike many of the RTTY-based press and weather services that have long since migrated to satellite, facsimile (or fax for short) has fared somewhat better over the past decade. Many stations can still be heard, from the US to Australia, sending pictures of press reports, weather or sea conditions. The gear needed to receive these pictures is also modest, and pictures appear in around five to ten minutes.

◆ How Does It Work?

Although strictly an analogue rather than digital mode when used in its HF radio form, fax works in much the same way that it did since the early 1900s. A drum, around which is wrapped the image (picture or text) to be sent, revolves at a constant speed. As the drum rotates, a sensor slowly moves down the image in "line" increments. Where the sensor sees dark, one tone is sent, when light, another tone. In fact, the World Meteorological Organization defines white as a tone of 2300 Hz and black as 1500 Hz. Like a normal RTTY FSK signal then, a fax signal typically shifts between 800, 900 or 1000 Hz as it moves from light to dark.

A fax decoder simply reverses this process to generate the received image. Of course, this whole process is now "virtual," with the functions of drum and sensor being carried out by a computer.

The speed of the image rotation is measured in RPM (Revolutions Per Minute), and the "line increments" by which the image is scanned is called the IOC (Index Of Cooperation). Not surprisingly, RPMs and IOCs are standardized. 120 RPM with an IOC of 576 is most common for weather pictures (60 and 90 RPM being less common but favored more by the Russian stations), and press photos tend to be sent at 60RPM and 362IOC.

Thus, in the same way that one sees RTTY-type signals logged as 50bd/500Hz/N (speed 50bd, shift 500Hz, and normal polarity) you will commonly see Fax logged as 120/576/800 (120 RPM, 576 IOC and 800 Hz shift).

◆ HF Fax Frequencies

Here is a list of the fax stations received consistently throughout 2000 from the eastern US.

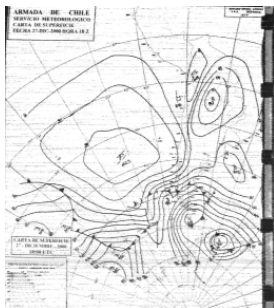
8040.00 GFA23
9110.00 NMF/NIK
10610.90 ???
11030.00 AXM34
11089.90 KVM70
13510.00 CFH
13900.00 BMB
13920.00 AXM35
14366.90 BAF8
14436.00 GFE23
14692.50 JMJ4
14982.60 RBV76
16035.00 9VF207
16134.90 KVM70
18441.20 JMJ5
18560.00 BMF
19327.90 "KAWN"

Bracknell Meteo, UK
US Coast Guard, Boston
Moscow Meteo, Russia
Canberra Meteo, Australia
Honolulu Meteo, Hawaii
Canadian Forces, Halifax
Taipei Meteo, China
Canberra Meteo, Australia
Beijing Meteo, China
Bracknell Meteo, UK
Tokyo Meteo, Japan
Tashkent Meteo, Azerbaijan
KYODO News, Singapore
Honolulu Meteo, Hawaii
Tokyo Meteo, Japan
Taipei Meteo, Taiwan
US Air Force AWS, Saddlebunch Key FL

◆ Decoding Fax

There is no shortage of options when it comes to decoding HF Fax today. The methods used tend to fall into one of three categories: software that uses a standard PC and soundcard, software using some hardware interface attached to the PC's serial or parallel ports, and the usual dedicated software and hardware packages. Here are some of the most popular choices:

- * **WxSat** is free for non-commercial use, and uses a MS Windows-based PC and soundcard.
- * **JVComm** uses a variety of interfaces including a soundcard on Windows-based PCs. Registering the program currently costs \$68.
- * **RadioRaft** uses a simple "bit slicing" interface connected to the serial or parallel port of a DOS-based PC, and costs \$30.
- * **Multimode** is for users of Macintosh computers and is available in Lite (\$39) and Standard (\$89) versions.



The dedicated decoders from Hoka, Wavecom and others all support HF Fax modes. Figure 1 shows a typical picture received by Day Watson with a Hoka Code30 decoder from the Chilean Navy's fax station "CBV."

◆ Want to Know More about Fax?

Probably the most respected site on the Internet is "HF Fax," maintained by long-time

aficionado Marius Rensen. There you can find a mountain of information about Fax, its various forms, software, hardware, frequencies, schedules and more.

◆ Baltic States and Canadian Forces on ALE

Finally this month, news of two new ALE networks originating in the ex-Russian Baltic states of Latvia and Lithuania. The Latvian Military has been heard on 7978, 9121, 13968.5, and 20216 kHz USB with the identifiers A25, GAL, GALVA, OZO, OZOLS, PAM, and PAMATS. It is interesting to note that the frequency of 9121 kHz also carries US National Guard ALE traffic.

The Lithuanian Military has been heard on 4836 and 5298 kHz USB with the identifiers VB1A, 3MP, NR5M, and VR5.

Also, units belonging to the 70th Communications Reserve of the Canadian Army were heard recently using ALE on 7801.5 kHz USB. Identifiers used correspond with the various unit numbers of this organization and are 700 (Borden), 709 (Toronto), 763 (Ottawa), and 7630A among others. ALE is used to trigger data transfers with MIL-188-110A 2400bd modems and the operators identified on USB voice with callsigns CIP709, CIP76 and CHH700. The procedure used by the operators follows that heard on the many other Canadian frequencies (see last month's ALE feature article) with stations announcing "Prepare for Romeo Tango Tango" before 2400bd modem bursts.

Until next month, enjoy the ones and zeros and don't forget to check DD's monthly logs which can found on-line by clicking on the "Latest Logbook" link at the Utility Monitoring Central homepage.

Resources

HF Fax	http://www.hffax.de
RadioRaft	http://perso.wanadoo.fr/radioraft/
JVComm32	http://www.jvcomm.de/
WxSat	http://www.hffax.de/WX_Satellite/WXSat/wxsat.html
Multimode	http://www.blackcatsystems.com/software/multimode.html
Hoka	http://www.hoka.net/
Wavecom	http://www.wavecom.ch/
UMC	http://www.mindspring.com/~mike.chace

WWFV Licensed To Broadcast Radioteletype

WWFV, Georgia, (formerly WGTG) announced it got FCC authorization Jan 4 to broadcast in radio-teletype mode, and offered a beautiful reception certificate as QSL, as noted by Kirk Trummel and John Norfolk. More details at their websites <http://www.wwfv.org> or <http://www.wwfv.net> also referred by Richard McClung.

Peter Taggart, General Manager, wrote us: We have begun our RTTY broadcast service to the hearing impaired. We use the ordinary Amateur Radio RTTY standard, so reception should not be a problem. As this service grows, we will add interesting and informative SWL, Amateur Radio, political, and other broadcasts. The website adds that this service is "desperately needed," and does not have the drawbacks of internet in cost and control. Programmers would make text files of their broadcasts available for WWFV to transmit in RTTY. WWFV transmitters are now named "Conquest." Initial RTTY in-

cluded King James Bible 1611 Authorized Version excerpts, sked:

Sun-Fri 2300-2400 UT 5085 [sic], Sat/Sun 1800-1900 UT 12172, Sun 0500-0600 UT 3270. We quickly heard this, not on 5085 but zero-beat on 5087 in the 2300 hour, shifting back to 5085 as USB resumed at 2357.

Joel Rubin remarks, "Might it be that the RTTY broadcasts are more motivated by the WWFV survivalist beliefs that the black helicopters/rioting in the streets are coming real soon now? I'm not sure that the ability to decode these broadcasts would survive the alleged catastrophe. And I've had my doubts about the threat from U.N. troops."

RTTY and other digital bursts are also an annoyance to voice broadcasters, such as 7400 and 9400 for Bulgaria, 9405 VOA, 7455 Greece, 6200 Prague, etc., observes Bob Thomas, CT.

AFGHANISTAN [non] The new <http://www.radioafghanistan.com> is focused on streaming Afghan music. There is a good chance that the Afghan opposition will begin to use the web more, so keep an eye on this (Clandestine Radio Watch)

ANGOLA R. Nacional de Angola on v3374.89, 2000 French. 2100 English. 2200 Portuguese. Announced also 4950 and 7245. All one hour later, compared to awful WRTH 2001 issue (Manfred Reiff, Denmark, BC-DX)

AUSTRALIA [and non] RA started adding more relays in Jan: Singapore, 0500-0530 17865 Khmere, 2300-2330 9730 Khmere, 1400-1530 15435 "Chinese" (Nigel Holmes and Roger Broadbent, RA Feedback) Vietnamese via Taiwan at 2330-2430 on 15110; this allowed Shepparton to replace Asian languages with more English to its primary targets, PNG and Pacific (via Richard Jary, Australian Radio DX Club) RA planned to add relays via Saipan and Darwin in late January (Roger Broadbent via John A. Figliozzi) And several sites more by end of February (Chris Hambly, Victoria)

AUSTRIA Engineer Herbert A. Kuhnle, who planned frequencies for R. Austria International, passed away in late December. Following his retirement from ORF, he continued to answer correspondence from listeners and exchange tapes, and attended EDXC conferences. (Risto Vahakainu, Finland, EDXC, BC-DX)

BOLIVIA The Bolivian Telecom Authority 'Superintendencia de Telecomunicaciones' has web site at: <http://www.sittel.gov.bo/> There's info on licensees on the 'Operadores' -page. It includes a downloadable Word-document of licensed radio stations dating from 11.10.2000. News can be found in 'Publicaciones'. All the resolutions (new licences, new freqs, call changes etc.) of the year 2000 can be found at <http://www.sittel.gov.bo/rsl2000.htm> in downloadable Excel-file. Frequency lists (in Excel-format) are on 'Nomenclador de Radiodifusión' -page at: <http://www.sittel.gov.bo/pblnrm.htm> (Pentti Lintujärvi, Helsinki, Finland, hard-core-dx)

6883.5, R. Impacto Cristiano, La Paz at 1155, NEW STATION! religious music with "Coral de los Andes." Announcing 6.880 megacilos (Rogildo Fontenelle Aragão, Cochabamba, Conexión Digital)

BRAZIL R. Cultura, São Paulo, seldom heard on 17815 anymore, is webcasting with great music: <http://www.tvcultura.com.br/radioam/radioam.asx> (gh) QSL received in 8 days from R. Difusora Taubaté, reactivated on 4925.

V/S: Emilio Amadei Berings Neto, Diretor Superintendente. Address: Rua Dr. Sousa Alves 960, Taubaté-SP. I advise QSL-collectors to send reports to the station now, as they are currently disposed to reply, always accompanied by some good souvenirs. I received 26 stickers, some 5 keychains, 8 or 9 pens, 3 rulers, a nice T-shirt. The station is really in a good mood



All times UTC; All frequencies kHz; * before hr = sign on, * after hr = sign off; // = parallel programming; + = continuing but not monitored; 2 x freq = 2nd harmonic; B-00=winter season, October 29-March 31; [non] = Broadcast to or for the listed country, but not necessarily originating there; u.o.s. = unless otherwise stated

toward DXers (Rudolf Grimm, Brazil, radioescutas)

CANADA CBC started a new weekly program, *Dispatches*, a Canadian focus to world events, replacing the final half-hour of *As It Happens* on Wednesdays, via RCI UT Thursdays 0030 on 9755, 5960; one hour earlier from April (gh)

For two days in Dec, instead of Austria relayed by Sackville at 1600-1658 on 17865, Britain's gay LBH Radio was heard instead (David Yocis, NY, hard-core-dx and gh) Probably a feed mixup by Merlin in London, fixed after they were notified (Bill Westenhaver, RCI)

CHINA CRI at 1800 in Russian on 6040 co-channel VOA (Silvain Domen, Belgium) Bob Padula also complains about CRI on VOA's longtime 9760. China does not seem to care about clashing with other SW stations' long-established frequencies (gh) That's certainly true. When CRI started using new high power transmitters to Europe there were wild clashes with existing assignments. After more than a year they finally left 6065 for 6040, 6065 being Radio Sweden's key frequency for its evening transmissions to Europe and in regular use, more or less, since 1930. Now Iran, another of the intruder nations, remains on 6065 (Olle Alm, Sweden, DXLD)

Dallas-based Continental Electronics announced an order for purchase of four high power shortwave transmitters from a customer in China, two 100 kW and two 500 kW (PRN Newswire via Ed Mayberry) Is there any "customer in China," ultimately, besides the Chicom government? Does Continental care if their equipment is ultimately used to jam Western broadcasts - or frees other transmitters to do so? (gh)

The services in minority languages had been called CNR-4, but China started a new service CNR-8 including SW in Kazakh, Korean, Mongolian, Tibetan, Uighur, while CNR-4 now applies to multi-lingual non-SW transmissions in Beijing, via satellite and live audio via <http://www.hownew.com/asx/0E.asx> CNR-8 is on the air from 2100 to 1700 with one hour in each language, rotating, on more in-band frequencies, but still partly on these old way-out-of-banders: 4190, 5420, 5440, 7935, 10260 (BBC Monitoring, summarized by gh)

COLOMBIA Some MW harmonics heard in Jan: On 2080.10, La Básica Mil-Cuarenta, Popayán at 1100, 2 x 1040.05. On 2099.92, Radio Uno, Montería, at 1120, with fantastic strength during local sunrise here in Quito, 2 x 1049.96. And on 5520.16, Armonías del Palmar, Palmira at 0200, heard quite regularly, Colombian music and quite long blocks of ads, 4 x 1380.04 (Björn Malm, Ecuador, SW Bulletin)

La Voz del Llano, Villavicencio, on 6178v at 1200 news, nothing on fundamental 6115; and at 0035 on 6185v (Yimber Gaviria, Colombia, DX Listening Digest)

La Voz de la Resistencia, FARC clandestine on 6233.7 at 2135-2232* with news (Rafael Rodríguez R., Bogotá, DC, Colombia, World Of Radio) Also heard on 6233.70, at *1124-1154+ with music and talk, low modulation (Dave Valko, PA, hard-core-dx)

CONGO DR On 6828.4, the week before Pres. Kabila was killed, at 1815 African music and talks in local language, many items about Congo and Rwanda, 1909 in French, no ID but in the DX press this has been logged as Bunia, operated by RCD rebels (Jari Savolainen, Finland, hard-core-dx)

COSTA RICA On 4260.68, Radio Pampa, Nicoya at 0100, now heard better, both morning and evening. Always a female DJ, 3 x 1420.22 (Björn Malm, Quito, Ecuador, *SW Bulletin*) 1125-1209 on 4260.66, harmonic also heard here in Japan! Almost non-stop salsa & merengue until 1200, then religious program. ID "... en toda la familia desde Pampa" (Shoji Yamada, Tokyo, *Radio Nuevo Mundo*)

Not only does Faro del Caribe have big problems with modulation and spurs on 9645v, but 5055, which is on all night, had bad hum, low modulation and distortion around 0830. Various splash downward was hard to distinguish with that coming upwards from its sputnik TIDGS on 5030, which had much stronger modulation on its fundamental (gh, OK)

CROATIA [non] Though they were terminated last year, Croatian Information Center relays appear again in the current DTK Germany schedule, including 9925 at 0000-0600 (gh) Ralf Weyl at DTK Jülich says they decided to start again from January 1 but the contract had expired and were waiting on a new one to be signed (Wolfgang Büschel, *World Of Radio*)

CUBA R. Rebelde once again is polluting the 60mb, with a number of very powerful and distorted spurious signals, from their primary freq of 5025 at 0900: 4990, 4960, 4925, 5060, 5095, and 5125. Also intermittent second harmonic on 10050 (David Hodgson, TN, *DXLD*) And 15075; also see VENEZUELA

DOMINICAN REPUBLIC R. Cristal, 5009.79, *1006-1040, open carrier, then sign-on with choral national anthem, canned sign-on announcement, music. Strong signal but very low modulation, especially during sign-on announcement (Dave Valko, PA, *hard-core-dx*) Audible 1100+ on exactly the same frequency, very good and strong (Brian Alexander, PA)

Relaying Radio Pueblo, 1510 AM. Canned IDs for "Radio Pueblo" and "15-10-AM". 0000 ID also as "los 5010 kilociclos de Radio Cristal Internacional en la banda tropical de 60 metros. Cruzando fronteras..." Strong signal but mostly distorted audio on some canned IDs, as if one of their tape machines was bad (Mark Mohrmann, VT)

ECUADOR On 3019.76, La Voz de la Juventud, Cañar in December at 1150, 2 x 1509.88, interference from Radio Monumental on its harmonic 3021.00, 2 x 1510.50 (Björn Malm, Quito, *SW Bulletin*)

GREECE A few years ago, you had an article in MT that the Radio Free Europe Portugal facility was closing up and that five 250-kW transmitters were being donated to the Greek government – three to Athens and two to Thessaloniki. VOG engineers are close-mouthed except that VOG hoped to begin using one of the new transmitters in Nov. Something is going on. In Jan, Radiophonikos Stathmos Makedonias in Thessaloniki had a vastly improved signal on 7430 from 1900 until sign-off at 2258 UT. There was nothing on the other Thessaloniki frequencies of 9935 and 11595. It seems possible they have cut the power off from their three 35 kW transmitters and are using the total 105 kW to power up their new 250 at reduced power, in test mode. Announced schedule on 7430 had a gap 1650-1800, when I suspect they were switching from the 35 to the 250 kW unit.

Something also is definitely in the works at the VOG's Avlis facility. One of the frequencies was silent 0800-2400. When they get the new 250 going, I suspect that they will direct it to North America using their 323 degree antenna and drop the rental of the Delano and Greenville VOA transmitters.

VOG has *Learn Greek from Radio*, every Friday at 1335-1348 on 12105 and/or 15650 toward Tashkent, "Mathete Ellinika Apo Radiophono" (John Babbis, Maryland)

GUIANA FRENCH Montsinéry relay station was operational by November but as of December still had problems requiring less than 10 percent of transmissions to be transferred to Issoudun, France (Ulrich Wegmüller, Swiss Radio International Frequency Management, *DXLD*)

ICELAND National Radio, 13865, at 1215-1300*, relay of FM educational service Radio Reykjavik, Channel 1. Some relays are live, some taped. The ones at 1215 and 2300 are live newscasts, reduced carrier AM, USB modulated, all in Icelandic (David Hodgson, TN, *Cumbre DX*)

Sources at AFRTS tell us the projected AFRTS station is still waiting on Icelandic government approval. No date for when that will happen (Hans Johnson, Dec 28, *Cumbre DX*)

INDIA AIR Kurseong has reactivated 4895, at 1450 carrying Radio Newsreel in English – a woman newsreader with correspondents reports, 1500 Hindi. The tinkling tune just before the half hour followed by 6 pips and more tinkling, "This is All India Radio...", and the usual 1530 English news; music and songs, abruptly cut at 1645 (Noël Green, England, *Cumbre DX* via *DXLD*)

JORDAN R. Jordan announced that as of Jan 20 they'd change [English] to 1400-1730 on 11690 (Erik Kæie, Denmark, *DX Listening Digest*) 11690 has RTTY co-channel and does not propagate well to NAM; 17 MHz would be fine if away from co-channel Chile! (gh)

KASHMIR [non] Voice of Jammu & Kashmir Freedom Movement sked per QSL-letter: 0230- 5985 kHz, 0745- 7230 kHz, 1300- 5100 kHz (K. Hashimoto, Japan, *Clandestine Radio Watch*)

KAZAKHSTAN Voice of Orthodoxy is a Russian language religious broadcaster 1630-1700 9355 Tu/Fr (Nikolai Rudnev, Russia, *NASWA-LN*)

KOREA NORTH R. P'yongyang, in English, schedule is similar to last month's, but at 1900-2000 to EuMEAF on 4.405 6.575 6.595 6.615 9.335 11.710 13.760 (© BBC Monitoring) Note three 6 MHz frequencies 20 kHz apart, spurs? (gh)

KURDISTAN Radio Station Freedom, Voice of the Communist Party of Iraqi Kurdistan heard on 3900v at *1557-1653* (R. Petraitis, Lithuania, *Clandestine Radio Watch*)

LITHUANIA Received a message from Rimantas Zakarevicius (LY2NX), in translation: Lithuania is looking for your help! Lithuanian radio started to transmit programs to North America directly. The transmitter is in Sitkunai, about 20 km

NW of Kaunas. Even though the economical situation is very difficult, funding was found (approximately one million litas [\$250,000 US]) for construction of a new, modern antenna. A beautiful antenna was built with the height of 110 m directed toward North America – azimuth 310 degrees. It is a co-linear, four level, four dipole system (a total of 16 dipoles). The gain is about 20dB, which is about 100 times! The antenna is wideband and can operate between 6 and 12 MHz. 9875 kHz is utilized between 0000 and 0100 GMT. The engineers at Sitkunai are relying on the help of American Lithuanians. Reports should be sent to Mr. Petras (Peter) Leskevicius, peles@lrtc.lt (via Joe Mikuckis, K3CHP, *DXLD*)

The German relay continued into January on 6120, and as a rule was much better here, lower frequency and less auroral zone to penetrate. While their do-it-ourselves attitude is laudable, especially when they seem so dedicated to continuing SW broadcasts to North America, what they should have done was buy time (after all, it only amounts to one hour a day) on a better positioned and less expensive outlet, e.g. WBCQ. Surely this would have been more effective, and more cost-effective, than buying and installing their own transmitter and antennas within Lithuania. But now they have it, are they going to operate it anything close to 24h to Europe or other targets? (gh) Heard at 2100 on 11730, from where? (Bob Padula, *EDXP*)

MALAWI SW frequencies have been missing since mid-December, 3380 and 5993 (Chris Hamby, Australia, Chris Greenway, *BBCM*)

MAURITANIA Radio Mauritania pounds into the UK evenings on 4845, strongest signal in the band. Modulation and stability fine. It is safe to conclude this is the new 250 kW that Thomcast was to install (Hans Johnson, UK, *Cumbre DX*) Thanks to this, westerly position, and northern winter darkness around yearchange, 4845 was still in at 0841 with Arabic music, and announcements; however, a subaudible heterodyne built up as it faded out to dominate by 0857, perhaps Brazilian (gh, OK)

MÉXICO XEVOZ, Bonita AM on 3180.00, 2 x 1590 harmonic at 1019-1033, romantic ballads, "Escuchas Bonita 15-90" (Mark Mohrmann, VT, *DXLD*)

MYANMAR Burmese Defense Forces Station appears to have reactivated, presumed based on frequency 6570, schedule, and programming *1330 (Richard Lam, Singapore, *Cumbre DX*) extended past 1530 (Hans Johnson, AZ, *Cumbre DX*) Plays very beautiful, oriental music (Björn Fransson, Sweden, *hard-core-dx*) sign-off at 1629 (Stuart, Blackpool, England, *hard-core-dx*)

NEW ZEALAND RNZ: Live RealAudio is available: Sun 1000-1205, 1900-2230; Mon-Thu 0300-0400, 0800-0900, 1000-1205, 1700-2230; Fri 0800-0810, 1700-2010; Sat 1000-1205. Valid until 18th March, 2001 (*BBCM*) When DST ends and SW frequencies no doubt change (gh)

NIGER La Voix du Sahel heard in wideband FM on 45.65 MHz at 0930. For most of the day the national programme from Niamey can be heard. The next day at 1400 UT a clear ID in French: Ici la Voix du Sahel, Station Regionale de Zinder. So I'm quite sure this is a sub-harmonic (one half) of 91.3 MHz where Zinder is listed. I think during the week there are no programs between 1300 and 1700. Once I only heard a carrier during this time (Jürgen Lohuis, Lünen, Germany, harmonics@egroups.com)

PAPUA NEW GUINEA

"KBBN", Mount Hagen, has a shortwave transmitter, courtesy of David Robinson of FBN's WTJC in North Carolina. They wanted to

start on shortwave instead of FM, but Pangtel would not assign a frequency, apparently not knowing how to do it. Pangtel thinks their priority is FM. Then Robinson of FBN told me KBBN will use shortwave to feed a network of about 10 FM repeaters in PNG as other means such as satellite are too expensive. His intention is to shoot the signal straight up so as to minimize skip zone. Robinson didn't feel that DXers would be able to hear it. He believes these will be in the 3-7 MHz range and include both a 'winter' and 'summer' frequency (Hans Johnson, *Cumbre DX*) They are on the Equator. What do they need seasonal frequencies for? Yeah, sure, just like DXers can't hear the Northern Australian "shower services" on 120 and 60m. Neat idea: SW quality as heard on FM! (gh)

"KBBN" is an acronym in Pidgin for the "Cry of the Bible Broadcasting Network", "Krai Bilong Baibel Bradkasting Netwok". Website is <http://www.harvesttemple.com/PNG/KBBN.html> (Brad Wells via Don Nelson, *Cumbre DX*)

PERÚ Some presumably illegal transmitters observed in Jan: 4600.72v, Radio San Juan, San Juan de Saigue at 0200, previously on 5421v and 5609v. DJ announced that they now (!) have applied for a licence at "el Ministerio de Transportes y Comunicaciones" and that it will take from one to three years to get it. On 5760.34, Radio Tigre at 0000, formerly drifted around 5580-5645v. On 6631.32, Radio Uno, Chiclayo, until 0240* with NA, previously on 4577.32 and 4579.44 (Björn Malm, Quito, Ecuador, *SW Bulletin*)

R. La Voz de Anta, 5323.6, Acobamba, Huancavelica, 0036-0057 huayno music, s/off 0100. Next morning I started monitoring at 0950, but nothing until abrupt sign-on at 1130 "Usted escucha Radio la Voz de Anta, en los 5320 kHz, desde la ciudad de Anta, Acobamba, Huancavelica, Radio la Voz de Anta, la diferencia en radiooo..."

On 5486.7, R. Reina de la Selva, Chachapoyas, bakery ad, 80s rock (Pedro F. Arrundategui, Lima, *Chasqui DX*)

PHILIPPINES FEBC have four new TCI 4x4 curtains in place at Bocaue. The transmission lines still needed to be completed, but they hoped to start using them

Shortwave Broadcasting

by end of Feb. After this, FEBC will look to upgrade its vintage US Signal Corps transmitters (Hans Johnson, *Cumbre DX*)

RUSSIA Sergei Sosodkin recently announced the untimely death of the well-known Russian DXer Nikolai Pashkevich due to a car accident in Moscow on January 5. Obituary is at <http://www.trsc.com/musings.html> and includes a photo of Nikolai taken at a meeting of Moscow DXers (Tom Sundstrom)

Radio Rossiya via Yuzhno-Sakhlinsk was well heard on 11840 USB at 0101 after an absence of several months. Co-channel with HCJB. Both at good levels, with HCJB usually slightly stronger. News program. Nice to see them back (Volodya Salmani, BC, DXLD) At 2100 I caught the R. Sakhalinsk ID. By 2125 level had increased to an easy S-6 with no QRM (Douglas W. Johnson, WA?, BC-DX)

Special program for fishermen "Kamchatka Rybatskaya" is 2000-2100 on 7355 12065 Tue, Thu and Sat only. Special program for seamen and fishermen from Vladivostok "Radio Station Tikh Okean" is 0815-0900 7175 7210 and 1900-1945 7135. 12045 may be used additionally at 0815 (Nikolai Rudnev, Russia, WDXC Contact) Very good on 7175, no English even on Sat as previously but greetings to sailors (Volodya Salmani, Queen Charlotte Is, BC)

VOR's morning English to NAM via Far East site on 7180 at 1500 was heard until closing at 1900* in Dec (Walt Salmani, Queen Charlotte Is, BC) VOR on 13666, not 13665 in English at 0209, listed as Petro-K (Liz Cameron, MI, MARE) and at 0254, not a typo (Larry Russell, MI, MARE) Obviously the Russkies were trying to break out superstitious Amerikanskies (gh)

Radiostantsiya Radonezh back on SW, 6245 Christmas day from 1800 tune-in past 1930, a special? (Silvain Dumen, Belgium, DXLD)

Russian Orthodox Radio Radonezh officially confirmed re-launch of SWBC. Press release on <http://www.pravoslavie.ru> says it started experiments December 25 for Ukraine, Belorussia and Moldova, 6245 at 17 to 20 UT. Station's own site <http://www.radrad.ru> invites reports to radior@mn.ru (Sergei Sosodkin, MI, DX Listening Digest) 6245 is located in Samara, the power is "more than 20 kW", antenna beamed "towards Ukraine and SE Europe" (Mikhail Timofeyev, Russia, in DX_BISTRO, via Bernd Trutenau, Lithuania, BC-DX)

SOMALIA Radio Baydhabo was first heard by BBCM in January 2001. It broadcasts in support of the Rahanwein Resistance Army (RRA); identifies in Somali Rahanwein dialect as "Radio Baydhabo, odka ururka RRA" (Radio Baydhabo, Voice of the RRA). 1600-1800 daily on 6806-v including News at 1700 daily (© BBC Monitoring) This is a reactivation. I believe that Baydhabo is the Somali spelling of Baidoa. Goal is to serve as a mouthpiece for this Army seeking to expel Husayn Aydid's forces from this area of Somalia (Hans Johnson, *Cumbre DX*)

Radio Hargeisa, 7530, confirmed with beautiful QSL card (with details); sent one dollar by registered mail to the Konsularische Vertretung of the Republic of Somaliland, Zedernweg 6, 50127 Bergheim, Deutschland. On the QSL is written: "10 KW T-antenna, QRG: 6390 6860 7122 7530 11640 khz". No v/s (Daniele Canonica, Switzerland, DXLD)

SOUTH AFRICA Add to schedule R. Lusofonia, Sat and Sun 1700-1900 in Portuguese on 7155, 100 kW, 76 degrees (André du Toit, SENTECH) Obviously aimed at Mozambique (gh) Quite good 1700-1800 on 7155, then blocked by Arabic, Jordan? Was mostly in English (Björn Fransson, Götland, *hardcore-dx*)

SPAIN Admirers of opera and classical music should listen to REE, M-F 1610-1700 for performances, all by Spanish orchestras. Reception and sound quality very good, on 21610 and 21700, i.e.; It's *La Mejor Música de Nuestro Sello* (Claudio Ghiggi, Brasil, *radioescutas*) From their own CD label; check <http://www.rtrve.es/rne/sello/index.htm> (Fernando de Sousa Ribeiro, Portugal, *ibid.*)

SRI LANKA [non] IBC Tamil: Given the demise of their website and my inability to hear them, I thought this may have gone off. When I rang them, I learned they were off 7460 0000-0100 for a few weeks, but are back. English news continues sometime during the last 10 minutes or so. IBC Tamil is also at 1500-1530 on 17490. Website and E-mail remained down and it didn't seem they would be bringing them back anytime soon (Hans Johnson, *Cumbre DX*)

SURINAME R. Apintie, 4991 at 0620 fair strength with a few good peaks, but low, distorted modulation. Mix of popular music, but mostly American Soul/R&B. Positive ID 0630 in what sounded like pidgin English, or a local dialect. "R. Apintie" was mentioned 6 times during this talk break. Peaked 0620-0720, fell in strength significantly after 0730 (David Hodgson, TN, *Cumbre DX*)

TAIWAN TaipeiWave newsletter asks that reception reports now be sent to: prog@cbs.org.tw and web page at <http://www.cbs.org.tw> is about to have some "exciting changes" (Mike Terry, UK)

THAILAND Radio Thailand, English to Europe at 0530-0600, to improve reception, changed Jan 15 to 12015. See <http://www.prd.go.th> e-mail: amporns@mozart.inet.co.th (R. Thailand via Craig Krist, VA)

Both Thailand and Vietnam are using 7285 at 1100 producing an awful clash: R. Thailand in Vietnamese and Cambodian; Voice of Vietnam in English. The band is not excessively crowded (Alan Davies, Vietnam, *Cumbre DX*)

TIBET [non] V. of Tibet, 1215-1300 kept changing frequencies from two transmitters and two sites in the 15595 to 15705 range (Harry Brooks, UK) sometimes on 15680 but seemed to avoid WWCR 15685 after complaints. Did not figure in IBB survey showing VOA number one (gh) Voice of Tibet, previously on

11570, No data e-mail reply in 1 day for follow up report sent to vot@nde.vsnl.net.in v/s: Sonam Dargay. Gives postal address as Voice of Tibet, Narthang Building, Gangchen Kyishong, Dharamsala 176215 H.P., India (K. Hashimoto, Japan, *Clandestine Radio Watch*)

TURKEY VOT webcast is at pnmm://212.175.166.3:7070/VoiceOfTurkey.rm You find this on the TRT page toward the bottom, <http://www.trt.net.tr> but not (that I can see) on the VOT page itself. Don't miss Reshida Morali's *Letterbox* Wednesdays around 1350, 1950, 2150, 2320, Thursdays 0420, tho we had good reception on 17815 at 1350-1410. She does the show in a very friendly and informal style, and we quickly learn a lot from her remarks. Her father was Turkish, from the European part of the Ottoman Empire, but she grew up in New York, which explains her accent, and ability to pronounce American names properly, unlike so many so-called English speakers, e.g. on the BBC. She recalled he beautiful fall colors the deciduous trees produced in upstate NY (gh)

As of Jan, Turkish Police Radio had not been on air for about 3 months because of a technical problem; hoped to return in a month or two to 7370, 7/24 to Turkey. Turkish Weather Radio is on air, 6900 kHz, 10 kW, 0500-1700 UT (summer 0400-1600) to Turkey (Sedef Somaltin, TRT HF Management, via George Poppin)

UKRAINE RUI announcer said 9385 is via a 100 kW transmitter in the Kiev suburb Brovary and not the 1000 kW as usual. I asked Alexander Yegorov about it (Craig Krist) 1000 kW transmitters are too expensive to maintain now. The Radio Company of Ukraine has no sufficient means to pay for their rent. But soon it may become a reality - the 1000 kW in Mykolayiv will replace 100 kW in Brovary on 9385 (Alexander Yegorov, DX-editor of Radio Ukraine International via Craig KG4LAC Krist) For English at 0100, 0400, one hour earlier summer

USA Judy Massa, VOA's music director and host of *Border Crossings* and *Country Music USA*, announced she would retire, her last *Border Crossings* January 26th. Judy has worked at VOA for over thirty years (Kim Elliott, VOA *Communications World* via John Norfolk) Her departure caused concern at CMAA that country music would have even less play in Europe. See her personal site <http://www.judymassa.com> (gh)

WWCR's big band show replaced by *Keen on Jazz*, with Joel and Dawn: Sat 1730-1830 12160, Sat 2300-2400 5070, Mon 0300-0400 3215 (WWCR website, Jan)

World Of Radio projected schedule for March via WWCR: Thu 2130 15685, Fri 1030 7435, Sat 0330 3215, Sat 1230 15685, Sun 0330 and 0730 5070, Sun 2000 12160, Mon 0100 3215, Mon 0600 3210, Tue 1200 15685. Times shift one UT hour earlier in April (gh)

[non] We still have conflicting info about the relay sites actually used by Herald Broadcasting Syndicate [Christian Science], thanks to WSHB's refusal to reveal them. Despite listings to the contrary, Saipan has not been used since August 1999, one year after KHBI was sold to IBB. 1000-1100 As 11870 is via Taiwan; 1200-1300 As 5915 Vladivostok, 9880 Komsomol'sk, 1300-1400 As 7460 Irkutsk (Nikolai Rudnev, Russia, NASWA-LN and Jim Moats, OH, DXLD) Languages vary depending on day of week

UZBEKISTAN R Tashkent English at 0100 has been on 7215 (ex 7285) for some time, clean reception (Olle Alm, Sweden, BC-DX)

VATICAN [non] Vatican R, via Chita, Russia, 6205.5, Dec 23 1245-1345*, in Asian languages (Brian Alexander, PA)

VENEZUELA YVTO off-frequency to 5001 and dominating WWV 5000.0000 which at 0830 was skipping over here; a heavy het; YVTO's own minutely time check clashes with the seconds when WWV does the same. But YVTO also inserts its own ID twice every minute between about :12 and :19 seconds, "Observatorio Naval Cagigal, Caracas, Venezuela".

Radio Nacional de Venezuela, 9540, after several months unheard, seems to be on the air only at 1100, although with Swiss QRM. On a Thursday had a program produced by Universidad Simón Rodríguez, ID as Radio Nacional, Antena Internacional (Jorge García Rangel, *Banda Tropical*, Club Dixistas de la Amistad)

VENEZUELA/CUBA The talk show hosted by Hugo Chávez, president of what is now officially being called "la República Bolivariana de Venezuela" is now being relayed by R. Rebelde and R. Habana Cuba ("on five SW frequencies for the Americas"), it was said at the beginning of the Jan 14 edition monitored live at <http://www.unionradio.com.ve> The program is aired every Sun, at approx. 1400-1730, on various TV channels and a huge network of Venezuelan AM and FM stations. The relays via RHC seem to have started after Cuban president Castro's visit to Venezuela last year, when the two leaders struck a deal by which Venezuela will sell petrol to Cuba on very advantageous terms. During Castro's visit to Venezuela, he also participated on Chávez' *Aló Presidente* show, Oct 29. Chávez used to take numerous phone calls from ordinary citizens when he started his show in May 1999, but the number of such calls seems to have dwindled (Henrik Klemetz, Sweden, DXLD)

Researching the frequencies for this <http://www.radiohc.org> is absolutely no help, outdated, and even so, self-contradictory. Frequency usage shows nothing after 1400, while other program titles show in the 1400-1500 period only (gh)

ZIMBABWE [non] Radio VOP [via Madagascar], 7120 heard in languages, with some English announcements, from 1701 until blocked at 1730; no signal at all the day before and the day after, tho propagation numbers were not very different (Walt Salmani, Queen Charlotte Is, BC)

Until the Next, Best of DX and 73 de Glenn!



0005 UTC on 7415

USA: WBCQ. Johnny Lightning's Radio New York program, calling himself the "Real Voice of America" from his, "bootiful Brooklyn facility." Trashed Matt Drudge referring to him as "Matt Sludge broadcasting with half his brain tied behind his back." Makes me think ole' Johnny is trying to be the left-wing Rush Limbaugh. **WHRI** 2300, 7580; **WWFV** (ex **WGTG**) 9320 USB, 2303 with *Power Hour* segment on lady who professes to be the bastard child of the Duke and Duchess of Windsor. (Sue Wilden, Noblesville, IN; William McGuire, Cheverly, MD)

0005 UTC on 15180

NORTH KOREA: Radio Pyongyang. Korean news with fading, // 13760, 11710. (Jim Boynton, Newton, MA) 0007-0018+, 13760.1 English news on Kim Jong Il. ID 0016 with rousing military music // 151179.9, nothing on // 11460. Station audible *0000-0005* 11460 with ID and news; 11710; //137600 SIO=544; //15180 SIO=544 (Harold Frodge, Midland, MI)

0017 UTC on 9400

BULGARIA: Radio Bulgaria. Bulgaria marks the 11th anniversary of the collapse of communism, //9400. (Bob Fraser, Cohasset, MA) 0345, 9400 *Radio Bulgaria Calling*; 2200-2245, 7200. (Jim Boynton, Newton, MA) 0330, 7400 *Time Out For Music*. (David Weronka, Benson, NC) 2145-2153+, 11700 feature on commercial radio SIO=4+33+; 2005-2012, 7500. East European news coverage to ID and *Behind the News* program. SIO=3+53. (Frodge, MI; McGuire, MD)

0400 UTC on 7180

RUSSIA: Voice of. World newscast. (Boynton, MA) *1300, 15460 station ID to newscast. *Moscow Mailbag* 2115 on 5940, featuring diamonds, Olympics, Lenin and WWII. (Fraser, MA)

0426 UTC on 15320

CLANDESTINE: Voice of Hope. Open carrier 0426 to instrumental music 0427. Sign-on announcement with freqs and schedules, and purpose of broadcast. Lively high-life style music. Male's 0430 talk segment in unid language, mentions of Sudan. English greetings to friends in Sudan and mentions of "Voice of Hope." Fair and clear signal quality. (Dave Valko, PA/Cumbre DX) **Voice of Jammu & Kashmir Freedom** 1415; 5101 kHz anti-Indian government programming. Signal quite satisfactory, 1437*. Address: P.O. Box 102, Muzaffarabad, Azad Kashmir via Pakistan. (Jouko Huuskonen, Turku, Finland/HCDX)

0552 UTC on 4960

DOMINICAN REP.: Radio Villa. Spanish. Fair signal for SIO 222, music program and station identification. (Daniele Canonica, Muggio, Switzerland)

0600 UTC on 9745

ECUADOR: HCJB. *Saludos Amigos* to station ID. (Boynton, MA) *Ham Radio Today* 1930 on 17660. (Fraser, MA)

1343 UTC on 13650

CANADA: Radio Canada Int'l. Interview with classical singer and her musical inspiration. (Wilden, IN) *Maple Leaf Mailbag*, 2125, 13650 (Fraser, MA); 0225, 9755 (Boynton, MA)

1350 UTC on 18960

SWEDEN: Radio Sweden. Report and interview on communities for the mentally handicapped. (Fraser, MA; McGuire, MD)

1410 UTC on 4850

INDIA: All India Radio-Kohima. Heavy interference from Tashkent. ID, "This is All India Radio, Kohima." AIR services noted as; 1720, 4940 **Guwahati** //4920 **Chennai**; //4910 **Jaipur**; //4880 **Lucknow**; //4800 **Hyderabad**; //4775 **Imphal**. Station **Radio Kashmir** 4950 to 1738*. (Huuskonen, FIN/HCDX)

1413 UTC on 21745

CZECH REP.: Radio Prague. Sports report into *Spotlight* show. (Boynton, MA) 2245, 7345 //9435 *A Day of Poetry in Public Places*. (Fraser, MA)

1459 UTC on 11734.09

ZANZIBAR: Radio Tanzania. After hearing this frequency in Hawaii, decided to sit on this freq and see if audible on the east coast. Signal did indeed pop on with highlife instrumental mu-

sic. Very brief children's vocals and male's extended newscast. Signal improved by 1505, fading by 1520. Never seemed to have an "official" sign-on, abruptly fades up with programming in progress. Signal very nice by 2000 recheck. (Valko, PA/Cumbre DX) 1655-1700, 11734 very good signal including music, ID and signal tone to 1700*. (Canonica, SU)

1600 UTC on 17680

JORDAN: Radio Jordan. Jordan *Ancient Cultures* program, featuring *Desert Castles # 7*, to classical music segments. Announcements to news broadcast and 1730*. (Martin Gallas, Jacksonville, IL) Station spur 6985 at 2033 //7155 with Arabic discussion. (Zacharias Liangas, Thessaloniki, Greece/HCDX)

1620 UTC on 7530 USB

SOMALIA: Radio Hargeisa. (Tentative) Very weak signal in local language, possibly Somalian. Recitations to Arabic style music at 1645. Utility interference commencing abruptly at 1645. Subsequent daily rechecks; 1644-1703, 7530 (Canonica, SU)

1945 UTC on 6973.1

ISRAEL: Galei Zahal. Signal noted early, although audio level weak but readable by 2005 with choral music and unid language. (Valko, PA/Cumbre DX) **Kol Israel** 2020; 9435 *Week in Review* (Boynton, MA; McGuire, MD)

1957 UTC on 11785

INDONESIA: Voice of Indonesia. Poor signal for ID, "this is the radio Voice of Indonesia" to anthem, ID repeat and schedule quote. **Deutsche Welle's Rwanda** relays' interference 2000. (Frodge, MI)

2055 UTC on 9965

ARMENIA: Voice of. Interval signal at tune-in, followed for station identification and newscast. *Mailbag* program including music selections. (David Ross, Hamilton, Ontario, Canada)

2100 UTC on 5100

LIBERIA: Radio Liberia Int'l. English news including segment on Liberian first lady. (Chambers, NY/ODXA) 2130-2204, 5100 Highlife music program to commentary. Station identification to brief time check and *Awareness* program. Very nice signal at tune-in but choppy towards the top of the hour. (Valko, PA/Cumbre DX) 2240-2310+. Continuous African music with brief top-of-the-hour English national news. SIO=332, improved after 2245. Best to monitor in USB, other modes impossible. (Frodge, MI)

2151 UTC on 6265

ZAMBIA: Radio Zambia. Vernaculars text with phone interviews. African highlife music to station identification. Choral national anthem to 2206*. Signal weak to poor. (Chambers, NY/ODXA)

2230 UTC on 13600

BELGIUM: Radio Vlaanderen Int'l. Station ID and music segment. (Mindy Scheer, Dunnellon, FL) 0420, 11985 (Weronka, NC) 0756, 5985 (Chambers, NY/ODXA; McGuire, MD)

2253 UTC on 7125

GUINEA: RTV Guineenne. French service of talk and music intervals. Flute interval signal 2323 to African highlife music and station ID. Orchestral national anthem to 0001 *. Signal very strong initially, generally good to sign-off. (Chambers, NY/ODXA)

2310 UTC on 9655

TURKEY: Voice of. *Hues and Colors* program on coal mining area on the Black Sea //6020. (Fraser, MA; Weronka, NC; McGuire, MD)

2314 UTC on 15280

ARGENTINA: Radio Rivadavia. Spanish. Sports roundup segment and mentions of stations' Radio Independencia and Radio Dobleve, plus phone calls. Commercial breaks to time pips to ID 2335 with mentions of "Argentina" and "Futbol Continental"; SIO=2+33) (Frodge, MI)

SIO = Signal strength, Interference, Overall quality

Thanks to our contributors – Have you sent in YOUR logs?
Send to Gayle Van Horn, c/o Monitoring Times (or e-mail
gayle@webworkz.com)
English broadcast unless otherwise noted.

European Websites

Completing this month's European DX focus, the following multilingual websites are current at press time. Many include Real Audio programming links as well as email addresses and links for online reception reports or forms.

Due to column space constraints, the most actively reported European websites are listed. Additional website addresses for relay sites may be obtained from *WRTH 2001* or *Passport to World Band Radio 2001*. This month's "The Idiosyncrasies of QSLing Europe" includes information on European relay transmitter sites.

ALBANIA Radio Tirana <<http://rtsh.sil.at>>
AUSTRIA Radio Austria Int'l <<http://roi.orf.at>>
BELARUS Radio Belarus Int'l/Radio Minsk <<http://www.tvr.by>>
BELGIUM RTBF International <<http://www.rtbf.be/ri>>
Radio Vlaanderen International <<http://www.rvi.be>>
BULGARIA Radio Bulgaria <<http://www.nationalradio.bg>>
CZECH REPUBLIC Radio Prague <<http://www.radio.cz>>
DENMARK Radio Danmark <<http://www.dr.dk/rdk>>
FINLAND YLE/Radio Finland <<http://www.yle.fi/fbc/rfinland>>
Scandinavian Weekend Radio <<http://www.swradio.net>>
FRANCE Radio France Int'l <<http://www.rfi.fr>>
GERMANY Adventist World Radio <<http://www.awr.org>>
Bayerischer Rundfunk <<http://www.br-online.de>>
Deutschlandfunk/ Deutschland Radio <<http://www.dradio.de>>
Deutsche Welle <<http://www.dwelle.de>>
Overcomer Ministry <<http://www.overcomerministry.com>>
Sudwestrundfunk <<http://www.swr-online.de>>
United Methodist Church <<http://www.gbgn-umc.org>>
Universal Life <<http://www.das-wort.com>>

GREECE Radio Makedonias <<http://www.ert3.gr>>
Voice of Greece <<http://alpha.servicenet.ariadne-t.gr/Docs/era5eng/index.htm>>
HUNGARY Radio Budapest <<http://www.kaf.radio.hu>>
ICELAND Icelandic Nat'l Broadcasting <<http://www.ruv.is>>
IRELAND RTE <<http://www.rte.ie/radio/>>
ITALY IRRS <<http://www.nexus.org>>
RAI International <<http://www.raiinternational.rai.it>>
LITHUANIA Radio Vilnius <http://www.lrtv.lt/lt_lrtv.htm>
MALTA Voice of the Mediterranean <<http://www.vom-malta.org.mt>>
MONACO Trans World Radio <<http://www.trw.org>>
NETHERLANDS Radio Netherlands <<http://www.rnw.nl>>
NORWAY Radio Norway Int'l <<http://www.nrk.no/radionorway>>
POLAND Radio Polonia <<http://www.radio.com.pl/polonia>>
Radio Racja <<http://www.racja.pl>>
PORTUGAL Radio Portugal Int'l <<http://www.rdp.pt/internacional>>
ROMANIA Radio Romania Int'l <<http://www.rri.ro>>
RUSSIA Voice of Russia <<http://vor.ru>>
SICILY Armed Forces Radio/AFRTS <<http://www.afrts.osd.mil>>
SLOVAKIA Radio Slovakia Int'l <<http://www.slovakradio.sk>>
SPAIN Radio Exterior de Espana <<http://www.rtve.es/rne/ree>>
SWEDEN Radio Sweden <<http://www.sr.se/rs>>
SWITZERLAND Swiss Radio Int'l <<http://www.sri.ch>>
UKRAINE Radio Ukraine Int'l <<http://www.nrcu.gov.ua/>>
UNITED KINGDOM BBC <<http://www.bbc.co.uk/worldservice/index.shtml>>
Virgin Radio/Global Sound Kitchen <<http://www.virginradio.co.uk>>
VATICAN CITY Vatican Radio <http://www.vatican.va/news_services/radio>
WALES Wales Radio International <<http://wri.cymru.net>>
YUGOSLAVIA Radio Yugoslavia <<http://www.radioyu.org>>

AUSTRIA

Radio Austria Int'l, 13730 kHz. Full data QSL card unsigned. Received in 13 days for an English email report. (Kris Krist, Annadale, VA)

BELGIUM

Radio Vlaanderen Int'l, 9925/13785 kHz. Full data color card unsigned, plus two stickers. Received in 47 days for an English report and one IRC. Station address: B-1043, Brussels, Belgium. (J.S. Summroll, Albany, NY)

EGYPT

Radio Cairo, 9990 kHz. Full data scenery card unsigned. Received in 86 days after second English follow-up report. Station address: P.O. Box 566, Cairo 11511 Egypt. (Brian Bagwell, St Louis, MO)

FINLAND

Scandinavian Weekend Radio, 11720 kHz. Full data computer generated card, including photos of the SWR staff and transmitter and crystals, plus two stickers and a brief personal letter. Received in two weeks for an English report and two U.S. dollars. Station address: P.O. Box 35, FIN-40321, Iyväskylä, Finland. (George, Maroti, NY/Cumbre)

GERMANY

Mitteldescher Rundfunk via Bayerischer Rundfunk, 6085 kHz. Full data station card unsigned, plus station souvenirs and brochures. Received in 46 days for a German report and one IRC. Station address used via Bayerischer Rundfunk: Rundfunkplatz 1, D-80300 Munchen, Germany. (Duane Hadley, Bristol, TN)

Sudwestrundfunk, 7265 kHz. Full data station logo card, sticker and German letterhead on station letterhead. Received in 85 days for an English report, German return mint postage, Texas travel brochure and Rangers baseball bumper sticker. Station address: Neckkartrasse 230, D-70190 Stuttgart, Germany. (Tom Banks, Dallas, Texas)

ICELAND

Icelandic Nat'l Broadcasting-Ríkissíðvarpid, 11402 kHz. Full data scenery card unsigned. Received in 63 days for an English report, one IRC (returned with reply) and souvenir postcards. Station address: Efstaleiti 1, IS-150 Reykjavik, Iceland. (Frank Hillton, Charles, SC)

LITHUANIA

Radio Vilnius, 9710 kHz. Full data scenery card unsigned. Received in 14 days for an email report. (Banks, TX)

MEDIUM WAVE

CHWK, 1270 kHz AM. This station is still CHWK, 850 Abbotsford is CKMA; 1240 Hops is CKGO per my letter from Chief Engineer Arnie Schmidt. The "new" call letters used are for FM, with plans to move to the FM service shortly. QSL certificate for Radio Max received in 40 days. Station address: #520-45715 Hocking Ave., Chilliwack BC V2P 6Z6 Canada. (Patrick Martin, Seaside, OR)

KAVT, 1680 kHz AM. Full data verification letter signed by Paul Shinn-Chief Engineer. Mentioned KAVT test was running 5 kW days, 1 kW nights. Station scheduled to begin Radio Disney format shortly. Station address: 139 W. Olive Ave., Fresno, CA 93728. (Martin, OR)

KJLL, 1330 kHz AM. Full data verification letter signed by Don Wiggins-General Manager. Received in ten days for an AM report. Station address: 1320 Campbell, Ste. 234, Tucson, AZ 85718. (Martin, OR)

Radio Free Europe/Radio Liberty, via Marcali, Hungary, 1188 kHz AM. Full data verification on station letterhead, signed by David Walcutt, plus a station sticker. Received in 25 days for a taped report. Station address: 1201 Connecticut Ave., N.W., Washington, DC 20036 USA. (Mickey Delmage, Sherwood Park, Alberta, Canada)

XEMO, BCN Tijuana. Spanish verification letter signed by Sergio Gorlarle Quiros-Gerente de promociones, plus La Poderosa bumper sticker. Re-

ceived in 40 days for a taped report. Station address: Grupo Uniradio, Gral. Manuel Marquez de Leon No. 950 Zona Rio, Tijuana BCN 22320 Mexico. (Martin, OR)

OMAN

Radio Sultanate of Oman, 15140 kHz. Full data QSL folder card signed by Salim Al-Nomani-Director of Frequencies. Received in 15 days after a follow-up email report (with my original report attached) sent to Mr. Salim. Station address: Ministry of Information, P.O. Box 600, Postal Code 113, Muscat, Oman. Email: <abulakman@hotmail.com> (Randy Stewart, Battlefield, MO)

SOMALIA

Radio Hargeisa, 7530 kHz. Full data QSL card, unsigned. Received in one month for an English report (sent as registered) and one US dollar. Station address: Konsularische Vertretung of the Republic of Somaliland, Zedernweg 6, 50127 Bergheim, Germany. (Daniela Canonica, Muggio, Switzerland)

SWEDEN

Radio Sweden, 18960 kHz. Balloon QSL card unsigned. Received in 24 days for an English email report. Station address: SE-105 10 Stockholm, Sweden. (Krist, VA; Sam Wright, Biloxi, MS)

UNITED STATES

Armed Forces Network 12689.5 kHz USB. Partial data email signed by Jennifer Gray-Broadcasting Operations Specialist. Received in three days for an English email report. Email address: <QSL@mediacen.navy.mil> (Bill Wilkins, Springfield, MO)

Can Youth Be Served?

A concern that is expressed with increasing frequency concerns the aging of the radio hobby and its participants. So, how to deal with it?

Interestingly, one school of thought says to ignore it. A representative of Radio France International at last year's *Challenges for International Broadcasting* conference in Montreal flatly stated that RFI has a policy of simply not programming for anyone under the age of sixteen. Peter Barnard, noted radio critic for *The Times* (of London) also appears unfazed. He says that interest in radio and what it has to offer is something that comes with maturity. So, inevitably, as youth turns to middle age, it will come to discover the value of radio.

I'm not so sure I share Mr. Barnard's confidence. My interest in international radio began in my pre-teen years and was driven as much by the wonder of the technology (for its time) as it was by its unique content. True, things have changed in the last thirty or forty years. But abject surrender in the face of competition doesn't sound like a winning formula.

So, I am glad that there are several stations that still make a honest effort to attract a younger audience. Being solidly middle-aged, I may be the wrong person to critique these programs. Nonetheless, the job does fall to me.

♦ The Internet as Bait

I might suggest that if you old fogies (notice I said "you") want to embark on an effort to interest a younger person in shortwave and international broadcasting, you might want to start with the Internet. For one thing, the audio quality is better. And the on-demand availability of programs allows for the "indoctrination" to take place at odd times when the "subject" may be more receptive. I've actually had some success in this regard.

The radio then becomes a "value-added" opportunity, useful when a computer is not readily available. In a recent editorial, *MT's* Bob Grove noted that radio sales have stabilized and even experienced a slight uptick, with evidence showing that some people were coming to radio by way of the Internet.

♦ Rock Music

Ultimately, though, content is key. Even with *MTV*, *The Real World* and music videos,

rock radio still holds a prominent place within youth social circles. Given the pervasiveness of American rock music and the vitality of local forms of the genre globally, the following programs will sound just familiar enough not to be threatening to a new listener, while offering enough that is fresh so as not to be boring. Much of the music heard here will eventually be released in the American market anyway and there is some cachet in having heard it first, months before others.

The BBC World Service <http://www.bbc.co.uk/worldservice> is a good place to start as it has a number of rock music programs with differing approaches. *Top Twenty* (T 1430; W 0130; H 0630) and *The UK Album Chart* (W 1445; H 0145) play some of the British best sellers. *Music X-Press* (F 1545; A 0145) zeroes in on the newest creative trends. *Music Mix* (M 1430; T 0130, W 0630) features rock stars spinning their favorites and talking about what's influenced them, while *The Alternative* (W 0405) highlights more obscure and challenging acts.

Sounds Nordic (S 1230, 1330, 1430; M 0230, 0330), Radio Sweden <http://www.sr.se/rs>, broadcasts every weekend except the first, continues a long tradition of Radio Sweden programs featuring Swedish and Nordic rock acts.

The Australian Music Show (M 0610; T 0640, 2240), Radio Australia <http://www.abc.net.au/ra> is produced for RA by the domestic Triple J network (see below) and features the latest Aussie releases. *Home Grown* (A 0006), Radio New Zealand International <http://www.radionz.co.nz/nr/f-nr.htm>, in turn, focuses on music that is purely Kiwi.

Very short takes (one tune a day) are on offer from *Soundbox* (M-A 2250, T-S 0420) on Radio Vlaanderen Internationaal and Radio Exterior de España (T-A 0027, 0127, 0527) showcasing Belgian and Spanish rock music, respectively.

♦ Youth Culture Programs/ Networks

An increasing number of young people are traveling to foreign countries, whether for education or recreation, and this is fueling an interest among them about what life is like for their peers elsewhere in the world. This is the focus of a small group of well-crafted programs produced by some forward-looking interna-

tional broadcasters. If the programs have a sound and pace, and deal with subject matter you find unappealing or even offensive, this may be evidence that they are "spot on" in their intent and focus. (Express some personal misgivings about them and this may just be enough to make them desirable in a younger person's eyes.)

Roughly Speaking (A 0030), Radio Netherlands <http://www.rnw.nl>, which focuses on the lifestyles and issues of Europe's youth, is the best of this bunch. It has a somewhat more serious and "hip" feel to it than *Cool!* (M 0515), Deutsche Welle <http://www.dwelle.de>, which, nonetheless, is a worthy entry in this genre. Both programs offer well written and timely reports, produced in a lively and appealing manner. *The Edge* (A 1905), BBC World Service focuses on music, movies and science in that order.

There are also three English language public broadcasting networks, now available on the Internet, that cater to youth in a different and, in some cases, more complete way than American commercial radio. BBC Radio One <http://www.bbc.co.uk/radio1> is that broadcaster's youth network and it focuses almost entirely on rock music. Australian ABC Triple J <http://www.abc.net.au/triplej> casts a little wider net musically and dabbles in science and technology topics, while serving as more of a "full service" youth culture and lifestyles network. Canada's CBC Radio Two <http://cbc.ca/audio.html>, which is largely a classical music and arts network, coolly transforms itself at the just the right times (week-day late nights and early mornings after 2200 ET; weekend nights and early mornings after 1900 ET) into a youth culture and music network par excellence.

♦ Mission Impossible?

Once you've succeeded in getting the younger generation interested in these offerings, you can try and move them to an intermediate level with more mainstream shortwave programs on technology, science—maybe even current events!

Until April, good listening!

[Times are in UTC and reflect broadcasts targeted to North America. Consult the *MT Short-wave Guide* for frequencies and day abbreviations used.]



HOW TO USE THE SHORTWAVE GUIDE

0000-0100 twhfa USA, Voice of America 5995am 6130ca 7405am 9455af
 ① ② ⑤ ③ ④ ⑥ ⑦

Convert your time to UTC.

Broadcast time on ① and time off ② are expressed in Coordinated Universal Time (UTC) – the time at the 0 meridian near Greenwich, England. To translate your local time into UTC, first convert your local time to 24-hour format, then add (during Standard Time) 5, 6, 7, or 8 hours for Eastern, Central, Mountain or Pacific Times, respectively. Eastern, Central, and Pacific Times are already converted to UTC for you at the top of each page.

Note that all *dates*, as well as times, are in UTC; for example, a show which might air at 0030 UTC *Sunday* will be heard on *Saturday* evening in America (in other words, 7:30 pm Eastern, 6:30 pm Central, etc.).

Find the station you want to hear.

Look at the page which corresponds to the time you will be listening. On the top half of the page English broadcasts are listed by UTC time on ①, then alphabetically by country ③, followed by the station name ④. (If the station name is the same as the country, we don't repeat it, e.g., "Vanuatu, Radio" [Vanuatu].)

If a broadcast is not *daily*, the days of broadcast Å will appear in the column following the time of broadcast, using the following codes:

Day Codes

s/S	Sunday
m/M	Monday
t/T	Tuesday
w/W	Wednesday
h/H	Thursday
f/F	Friday
a/A	Saturday
D	Daily
mon/MON	monthly

In the same column ⑤, *irregular broadcasts* are indicated "tent" and programming which includes languages besides English are coded "vl" (*various languages*).

Choose the most promising frequencies for the time, location and conditions.

The frequencies ⑥ follow to the right of the station listing; all frequencies are listed in kilohertz (kHz). Not all listed stations will be heard from your location and virtually none of them will be heard all the time on all frequencies.

Shortwave broadcast stations change some of their frequencies at least twice a year, in April and October, to adapt to seasonal conditions. But they can also change in response to short-term conditions, interference, equipment problems, etc. Our frequency manager coordinates published station schedules with confirmations and reports from her monitoring team and MT readers to make the Shortwave Guide up-to-date as of one week before publication.

To help you find the most promising signal for your location, immediately following each frequency we've included information on the *target*

area Å of the broadcast. Signals beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible.

Target Areas

af:	Africa
al:	alternate frequency (occasional use only)
am:	The Americas
as:	Asia
au:	Australia
ca:	Central America
do:	domestic broadcast
eu:	Europe
irr:	irregular (Costa Rica RFPI)
me:	Middle East
na:	North America
om:	omnidirectional
pa:	Pacific
sa:	South America
va:	various

Consult the propagation charts.

To further help you find a strong signal, we've included a chart on page 64 which takes into account conditions affecting the audibility of shortwave broadcasts. Simply pick out the section of the chart for the region in which you live and find the line for the region in which the station you want to hear is located. The chart indicates the optimum frequencies (in megahertz-MHz) for a given time in UTC. (Users outside North America can use the same procedure in reverse to find best reception from North America.)

Choose a program or station you want to hear.

Selected programs appear on the lower half of the page for prime listening hours – space does not permit 24 hour listings nor can every station be listed. However, listings for the most popular stations and selected lesser-known stations illustrate the variety available on shortwave. The format of the listings alternates among three different styles – by station, by genre and by day – month by month. Times listed are approximate and programs are subject to change.

The program listings emphasize broadcasts targeted to North America. In most cases, the stations and programs listed should be readily receivable in North America using a portable radio. Most broadcasters produce one broadcast in English per day that is repeated over a 24 hour period to all areas. If you are able to listen to transmissions to other areas of the world during "non-prime time" hours, referring to the prime time listings for those stations will likely be helpful in determining what programs will be broadcast.

Occasionally, a program or station listing may be followed by a reference to another listing for the same program or station at a different time. This is done to conserve space and make it possible to provide more listings.

MT MONITORING TEAM

Gayle Van Horn
Frequency Manager
gayle@webworkz.com

John Figliozi
Program Manager
jfiglio1@nycap.rr.com

Mark Fine, VA
mark.fine@fineware-swl.com

PROGRAM HIGHLIGHTS

JOHN FIGLIOZZI

Three for Three

With this month's program listings, we complete our three month remake of the *Shortwave Guide* section of this magazine. If you've been a long-time reader of *MT*, the layout of this month's listings should look rather familiar to you. This format, as with the other two introduced in January and February, will appear every third month. As you page through this section, please note the fuller descriptions that accompany each listing and, for the first time, precise advance details in a few cases—notably for some *BBCWS* programming and for *Radio Netherlands' Weekly Documentary* program. It is exceedingly difficult to obtain specific information about program topics even a few days ahead of time, let alone the five or six weeks needed to meet printing deadlines for a magazine. Nonetheless, when we can get them, you will see them here in the listings each month.

Keeping three months' issues of *MT* handy, you can now access programming information for each "prime-time" shortwave hour by station, by program content, and by day. Updates will be made monthly as we get them. We will stress stations that are readily receivable with a portable radio and that do not necessitate the use of a complex antenna system. In the main, the broadcasts listed in the *Selected Programs* columns will be those that are targeted to North America; but, in some cases, the listings will include broadcasts to other areas that have been reported to be well received on this continent. As well, stations that have been identified by polling data as the most popular with listeners will have their listings in *MT* every month. As space permits and information is available, we will include other lesser known stations in the interests of rounding out the shortwave programming picture.

Finally, don't hesitate to drop us a line – either electronically or by post. We would dearly love to have your reactions to and observations about this effort *and* have you contribute to the effort with timely program information that you observe, obtain or hear.



0000	0015		Cambodia, National Radio of	11940as					0000	0100	vl/a	Solomon Islands, SIBC	9545do				
0000	0015		Japan, Radio	17810as	13650as				0000	0100		Spain, R Exterior Espana	6055na				
0000	0030		Egypt, Radio Cairo		9900am				0000	0100	as	UK, Global Kitchen/Merlin	3955eu	6180eu	7165eu		
0000	0030		Mexico, R Mexico International	9705am	11770al				0000	0100	f	UK, Global Kitchen/Merlin	6170eu				
0000	0030		Thailand, Radio	9680va					0000	0100		USA, Armed Forces Radio	4278va	4319va	4993va	5765va	
0000	0030		UK, BBC World Service	3915as	5965as	5975na	6175na					6350va	6458va	6847va	10320va	10940va	
				6195as	7105as	9410me	9590am	9915sa				12579va	12689va	13362va	16847va		
				11945as	11955as	12095sa	15280as	15360as	0000	0100		USA, KAIJ Dallas TX	5755va				
				17615as	17790as				0000	0100		USA, KTBN Salt Lake City UT	7510na				
0000	0045		India, All India Radio	9705as	9950as	11620as	13605as		0000	0100		USA, KWHR Naalehu HI	17510as				
0000	0056		North Korea, R Pyongyang	4405va	11460na	11710na	13760na		0000	0100	tw/ha	USA, Voice of America	5995am	6130ca	7405am	9455ca	
				15180na								9775am	11695ca	13740am			
0000	0059		Canada, R Canada International	5960am	9755am				0000	0100		USA, WBCQ Monticello ME	7415na				
0000	0100		Anguilla, Caribbean Beacon	6090am					0000	0100		USA, WEWN Birmingham AL	5825va	7425na	9355na		
0000	0100	vl	Australia, ABC/Alice Springs	4835do					0000	0100		USA, WHRA Greenbush ME	7580na				
0000	0100	vl	Australia, ABC/Katherine	5025do					0000	0100		USA, WHRI Noblesville IN	7315sa				
0000	0100	vl	Australia, ABC/Tennant Creek	4910do					0000	0100		USA, WINB Red Lion PA	12160am				
0000	0100		Australia, Christian Voice	9875va	15165va	17645va	21680va		0000	0100		USA, WJCR Upton KY	7490va	13595as			
0000	0100		Australia, Radio	9660pa	12080pa	15240as	17580va		0000	0100		USA, WRMI Miami FL	9955am				
				17750as	17795va				0000	0100		USA, WSHB Cypress Crk SC	9430am				
0000	0100		Bulgaria, Radio	7400na	9400na				0000	0100		USA, WTJC Newport NC	9370na				
0000	0100		Canada, CBC Northern Service	9625do					0000	0100	sm	USA, WWBS Macon GA	11900eu				
0000	0100		Canada, CFRX Toronto ON	6070do					0000	0100		USA, WWCN Nashville TN	3215am	5070am	5935am	7435am	
0000	0100		Canada, CFVP Calgary AB	6030do					0000	0100		USA, WWFV McCaysville GA	5085va	6890am			
0000	0100		Canada, CHNX Halifax, NS	6130do					0000	0100		USA, WYFR Okeechobee FL	6085na	9505na	15060as		
0000	0100		Canada, CKZN St John's NF	6160do					0000	0100	vl	Vanuatu, Radio	3945do	4960do	7260do		
0000	0100		Canada, CKZU Vancouver BC	6160do					0000	0100		Zambia, Christian Voice	4965do				
0000	0100		Costa Rica, R for Peace Intl	7480va	15048va	15065va			0030	0100		Iran, VOIRI	6065am	6135na	6150na	9022na	
0000	0100		Costa Rica, University Network	7490va	15048va	15065va	21815usb		0030	0100		Kirgiziya, Kirgiziya Radio	4010eu				
0000	0100		Ecuador, HCJB	9745na	11840na	21455usb			0030	0100		Lithuania, Radio Vilnius	6000na	9875na			
0000	0100	a/monthly	Finland, Scandv Weekend Radio	11690va	11720va				0030								

March 2001 MONITORING TIMES 43

FREQUENCIES

0100 0110	Italy, RAI International	6010na	9675na	11800na	0100 0200 vl	Papua New Guinea, NBC	9675do	11880do
0100 0115	Pakistan, Radio	9780as	11650as	15455as	0100 0200	Singapore R Corp of Singapore	6150do	
0100 0125	Netherlands, Radio	6165na	9845na		0100 0200 vl/as	Solomon Islands, SIBC	5020do	
0100 0127	Czech Rep, Radio Prague Intl	6200na	7345na		0100 0200 vl/a	Solomon Islands, SIBC	9545do	
0100 0127	Iran, VOIRI	6065am	6135na	6150na 9022na	0100 0200	Spain, R Exterior Espana	6055na	
0100 0127	Vietnam, Voice of	9525na			0100 0200	Sri Lanka, Sri Lanka BC Corp	4940do	6005as 6075as 9770as
0100 0130 s	Germany, Universal Life	9435as				15425as		
0100 0130	Slovakia, R Slovakia International	5930na	7230ca	9440sa	0100 0200	Switzerland, Swiss R International	9905am	
0100 0130	USA, Voice of America	7115as	7200as	9850as	0100 0200	UK, BBC World Service	5965as	5975na 6175na 6195as
		11705as	11820as	15250as 15300as 17740as		9410me	9590am	9915sa 11955as 12095sa
		17820as				15280as	15310as	15360as 17790as
0100 0130	Uzbekistan, Radio Tashkent	5955as	5975as	7105as 7215as	0100 0200 as	UK, Global Kitchen/Merlin	3955eu	6180eu 7165eu
		9540as			0100 0200	Ukraine, R Ukraine International	7420na	9610na 9385na 9810na
0100 0145	Germany, Deutsche Welle	6040am	6145na	9640am 9700na		11840na		
		9765na			0100 0200	USA, Armed Forces Radio	4278va	4319va 4993va 5765va
0100 0156	China, China Radio International	9570na				6350va	6458va	6847va 10320va 10940va
0100 0156	North Korea, R Pyongyang	3560va	11735va	15229va 17734va		12689va	12689va	13362va 16847va
0100 0200	Anguilla, Caribbean Beacon	6090am			0100 0200	USA, KAIJ Dallas TX	5755va	
0100 0200 vl	Australia, ABC/Katherine	5025do			0100 0200	USA, KTBN Salt Lake City UT	7510na	
0100 0200 vl	Australia, ABC/Tennant Creek	4910do			0100 0200	USA, KWHR Naalehu HI	17510as	
0100 0200	Australia, Christian Voice	9875va	15165va	17645va 21680va	0100 0200 twfha	USA, Voice of America	5995am	6130ca 7405am 9455ca
0100 0200	Australia, Radio	9660pa	12080pa	15240as 15415as		9775am	13740am	
		17580va	17750as		0100 0200	USA, WBCQ Monticello ME	7415na	9335na
0100 0200	Canada, CBC Northern Service	9625do			0100 0200	USA, WEWN Birmingham AL	5825na	7425na 9355na
0100 0200	Canada, CFRX Toronto ON	6070do			0100 0200	USA, WHRA Greenbush ME	7580na	
0100 0200	Canada, CFVP Calgary AB	6030do			0100 0200	USA, WHRI Noblesville IN	7315sa	
0100 0200	Canada, CHNX Halifax, NS	6130do			0100 0200	USA, WINB Red Lion PA	12160am	
0100 0200	Canada, CKZN St John's NF	6160do			0100 0200	USA, WJCR Upton KY	7490va	13595as
0100 0200	Canada, CKZU Vancouver BC	6160do			0100 0200	USA, WRMI Miami FL	9955am	
0100 0200	Costa Rica, R for Peace Intl	7480va	15048va		0100 0200	USA, WSHB Cypress Crk SC	9430na	
0100 0200	Costa Rica, University Network	7480va	15048va	15065va 21815usb	0100 0200	USA, WTJC Newport NC	9370na	
0100 0200	Cuba, Radio Havana	6000na	9820na	11705na	0100 0200 sm	USA, WWBS Macon GA	11900eu	
0100 0200	Ecuador, HCJB	9745na	11840na	21455usb	0100 0200	USA, WWCN Nashville TN	3215am	5070am 5935am 7435am
0100 0200	Finland, Scandv Weekend Radio	11690va	11720na		0100 0200	USA, WWFV McCaysville GA	5085va	6890am
0100 0200	Germany, Voice of Hope	6185na			0100 0200	USA, WYFR Okeechobee FL	6065na	9505as 15060as
0100 0200	Guyana, Voice of	3289do	5949do		0100 0200 vl	Vanuatu, Radio	3945do	4960do 7260do
0100 0200	Indonesia, Voice of	9525va	11785va	15149va	0100 0200	Zambia, Christian Voice	4965do	
0100 0200	Japan, Radio	9515va	11860as	11870va 15325as	0130 0145 vl	Libya, Voice of Africa	11815af	17725af
		17835sa	17845as		0130 0159 s	Finland, YLE/R Finland	9655na	12035na
0100 0200	Liberia, Voice of Hope	6280af			0130 0200	Lithuania, Radio Vilnius	6120na	
0100 0200	Malaysia, Radio	7295do			0130 0200	Sweden, Radio	7290as	9495as
0100 0200	Malaysia, RTM Kota Kinabalu	5980do			0130 0200	UK, RTE Radio	6155ca	
0100 0200	Namibia, Namibian BC Corp	3270af	3289af		0130 0200 twfha	USA, VOA Special English	7405am	9775am 13740am
0100 0200	New Zealand, R New Zealand Int'l	17675pa			0130 0200 twfha	USA, Voice of America	5995am	6130ca 9455ca
0100 0200	New Zealand, ZLXA	3935do	7290do		0140 0200	Vatican City, Vatican Radio	7335au	9650au

SELECTED PROGRAMS

Sunday

0100	BBCWS(am)	The World Today (the BBC's agenda-setting flagship global news program)
0105	Deutsche Welle R. Australia	Talking Point (European journalists discuss the week)
	R. Netherlands	The Europeans (historical and cultural perspectives on European societies)
	R. New Zealand Int.	Europe Unzipped (past week, unusual events)
	R. Prague	Eureka! (reports on science in NZ)*
0110	HCJB Ecuador	Readings from Czech Literature
	R. Prague	DX Partyline (Allen Graham hosts a weekly program for DXers and SWLs)
	Swiss R. Int.	Saturday Music (Czech classical, folk, jazz or rock)
		The Name Game (listeners try to identify a mystery Swiss location) [1st Sun. of the month]
0115	Deutsche Welle	Inside Europe (a weekly magazine exploring the topical issues shaping the continent)
	Spanish Foreign R.	American Chronicles (a Spanish perspective)
0120	China R. Int.	In the Spotlight (Chinese arts and cultural magazine)
0130	BBCWS(am)	Reporting Religion (Jane Little presents the week's main religious news)
	RTE Ireland	Sportsnews (reports of weekend events)
	Spanish Foreign R.	Spain in the American West (Spanish social and cultural influences on the western U.S.)
	YLE R. Finland	Capital Cafe (conversations with Finns)
0140	R. Habana Cuba	DXers Unlimited (Arnie Caro presents a program from radio enthusiasts)
	Swiss R. Int.	(repeat broadcast of the 0110 program)
0145	BBCWS(am)	Letter from America (Alistair Cooke's weekly commentary on life in the USA)
0150	YLE R. Finland	Nuunti Latini (the news in classical Latin)

Monday

0100	BBCWS(am)	The World Today (the BBC's agenda-setting flagship global news program)
	WWCR(5070kHz)	World of Radio (Glenn Hauser's comprehensive review of the week in international broadcasting)
0105	Deutsche Welle	Religion and Society (an insight into religious events)
	R. Netherlands	Wide Angle (a single issue examined in-depth)
0110	R. Australia	Away! (Australia's only national indigenous arts and culture program)
0115	Deutsche Welle	Arts on the Air (Breandain O'Shea covers the German cultural scene)

Monday-Friday

0130	Spanish Foreign R.	Entremeses (the food and sites in Spain's regions)
	RTE Ireland	Sportsnews (reports and accounts on the weekend's events)
		In Touch with New Zealand (a domestic afternoon variety program hosted by Wayne Mowat)*

Tuesday

0105	BBCWS(am)	Meridian-Ideas (a series that explores "big" cultural ideas)
0110	R. Australia	The Science Show (a long-running ABC program)
0130	BBCWS(am)	The Music Mix (insights into current popular music) [thru 28th-Blues World-Tony Russell looks back at blues' heritage and plays the best of the new]
	China R. Int.	Sports World (sports in China and Asia)
	Deutsche Welle	Insight (major international trends and developments)

Tuesday-Saturday

0100	R. Netherlands	Newsline (news, analysis and background reports)
	Spanish Foreign R.	REE's News Service (featuring international, Ibero-American and national news in-depth, a review of the Spanish press, commentaries and analyses)
	VOA	News Now (the VOA's continuous rolling news service with analysis, sports, business reports and topical features)
0105	Deutsche Welle	Newslink (daily current affairs magazine focused on Europe)
0110	HCJB Ecuador	Studio 9 (focused reports on Latin America)
0130	RTE, Ireland	The News at Six (RTE's flagship evening news program)
0145	Spanish Foreign R.	Spanish Language Course

Wednesday

0105	BBCWS(am)	Meridian-Screen [thru 29th-On Screen-a weekly report on international cinema]
0110	R. Australia	The National Interest (Terry Lane's round-up of the week's major issues)
0130	Deutsche Welle	Man and Environment (John Hay presents the human element in environmental issues)
0140	R. Habana Cuba	DXers Unlimited (Arnie Caro presents a program from radio enthusiasts)

Thursday

0105	BBCWS(am)	Music Review (classical music news and features)
0110	R. Australia	Background Briefing (ABC Radio's award-winning current

0130	BBCWS(am)	affairs radio documentary program)
	Deutsche Welle	Westway (a radio soap opera)
	HCJB Ecuador	Living in Germany (people, places and events)
		Ham Radio Today (Graham Bulmer hosts a program for radio amateurs)

Friday

0105	BBCWS(am)	Meridian-Writing (reports on books, theatre, poetry, journalism, biography, history and anthropology) [thru 10th-Writers on Location-Rosemary Harthill meets authors who identify with a particular part of Britain.]
0110	R. Australia	Hindsight (Australian social history woven from the memories of those who were there)
0115	Deutsche Welle	Spotlight on Sport (report on German and European sport)
0130	BBCWS(am)	World of Music (the best of folk, non-Western classical and non-Western popular music)

Saturday

0105	BBCWS(am)	Meridian-Masterpiece (critiques of creative endeavors)
0110	R. Australia	Arts Talk (Julie Copeland presents the world of arts and cultural ideas)
0130	BBCWS(am)	Westway (a radio soap opera)
	Deutsche Welle	German by Radio (a language lesson)
	HCJB Ecuador	Musica del Ecuador (Jorge Zambrano presents selections of Ecuadorian and Andean music)
	WWCR(3215 kHz.)	World of Radio (Glenn Hauser's comprehensive review of the week in international broadcasting)
0133	VOA	Communications World (Kim Elliott reviews the week in global communications)
0135	Spanish Foreign R.	Radio Club (answering listeners' letters)
0145	BBCWS(am)	Revolver (a musical guest gives a personal view on new releases from country to techno)
	Spanish Foreign R.	Radio Waves (a weekly program for radio enthusiasts)

(*This RNZI program airs one hour UT later from March 18.)



0200	0300	South Korea, R Korea Intl	7275na	11725sa	11810sa	15575na
0200	0300	Sri Lanka, Sri Lanka BC Corp	6005as	6075as	6130do	9770as
		15425as				
0200	0300	Taiwan, R Taiwan International	5950na	9680na	11740as	11825pa
		15125as	15345as			
0200	0300	UK, BBC World Service	5975na	6135am	6175na	9410me
		9770af	9915sa	11760me	11955as	12095sa
		15280as	15310as	15360as	17790as	
0200	0300	USA, Armed Forces Radio	4278va	4319va	4993va	5765va
		6350va	6458va	6847va	10320va	10940va
		12579va	12689va	13362va	16847va	
0200	0300	USA, KAIJ Dallas TX	5755va			
0200	0300	USA, KJES Vado NM	7555na			
0200	0300	USA, KTNB Salt Lake City UT	7510na			
0200	0300	USA, KWHR Naalehu HI	17510as			
0200	0300	USA, Voice of America	7115as	7200as	9850as	11705as
		11820as	15250as	15300as	17740as	17820as
0200	0300	USA, WBCQ Monticello ME	7415na	9335na		
0200	0300	USA, WEWN Birmingham AL	5825va	7425na		
0200	0300	USA, WHRA Greenbush ME	7580na			
0200	0300	USA, WHRI Noblesville IN	7315sa			
0200	0300	USA, WINB Red Lion PA	12160am			
0200	0300	USA, WJCR Upton KY	7490va	13595as		
0200	0300	USA, WRMI Miami FL	7385am			
0200	0300	USA, WSHB Cypress Crk SC	9430na	7535na		
0200	0300	USA, WTJC Newport NC	9370na			
0200	0300	USA, WWCR Nashville TN	3215am	5070am	5935am	7435am
0200	0300	USA, WWVF McCalysville GA	3270va	5085am		
0200	0300	USA, WYFR Okeechobee FL	6065na	9505na		
0200	0300	vl Vanuatu, Radio	3945do	4960do	7260do	
0200	0300	Zambia, Christian Voice	4965do			
0200	1215	Cambodia, National Radio Of	11940as			
0215	0220	Nepal, Radio	5005as	7165as		
0230	0257	Vietnam, Voice of	9525na			
0230	0300	Austria, R Austria International	7325na			
0230	0300	Slovakia, Adventist World Radio	7235as			
0230	0300	Sweden, Radio	7155alt	9495am		
0230	0300	Switzerland, Swiss R International	9885am	9905am		
0245	0300	Albania, R Tirana International	6115na	7160na		
0250	0300	Vatican City, Vatican Radio	7305am	9605am		
0250	0300	vl Zambia, National BC Corp	6165do	6265do		
0257	0300	vl Malawi, Malawi BC Corp	3380do			
0300	0310	mtwhf Greece, Voice of	5895eu	7455na	7475eu	12105na
0300	0310	Vatican City, Vatican Radio	7305am	9605am		
0300	0325	S Africa, Channel Africa	9525af			
0300	0330	sm w f a Belarus, R Belarus International	5970eu	7210eu		
0300	0330	Egypt, Radio Cairo	9475am			
0300	0330	S Africa, Adventist World Radio	9515af			

45



0300	0330		Thailand, Radio	15460na					0300	0400	v/	as	Solomon Islands, SIBC	5020do			
0300	0330	a	UK, Wales Radio Intl/Merlin	9735na					0300	0400	v/	a	Solomon Islands, SIBC	9545do			
0300	0330		USA, KJES Vado NM	7555na					0300	0400			Sri Lanka, Sri Lanka BC Corp	6005as	6075as	6130do	9770as
0300	0330	mtwhf	USA, Voice of America	4960af									15425as				
0300	0345		Germany, Deutsche Welle	6045na	9535na	9640na	9700na		0300	0400			Taiwan, R Taiwan International	5950na	9680na	11745as	11825as
			11750na										15345as				
0300	0345	vl	Libya, Voice of Africa	11815af	15420af				0300	0400			Uganda, Radio	4976do	5026do		
0300	0356		China China Radio International	9690na					0300	0400			UK, BBC World Service	3255af	5975na	6005af	6135am
0300	0400		Anguilla, Caribbean Beacon	6090am									6175na	6190af	6195ue	7160af	9410eu
0300	0400	vl	Australia, ABC/Alice Springs	4835do									11730af	11760me	11765af	11955me	12095af
0300	0400	vl	Australia, ABC/Katherine	5025do									15280as	15310as	15360as	15420af	17760as
0300	0400	vl	Australia, ABC/Tennant Creek	4910do									17790as	21660as			
0300	0400		Australia, Christian Voice	9865va	15185va	17645va	21680va		0300	0400			USA, Armed Forces Radio	4278va	4319va	4993va	5765va
0300	0400		Australia, Radio	9660pa	12080pa	15240as	15415as						6350va	6458va	6847va	10320va	10940va
			15515va	17580va	17750as	21725va							12579va	12689va	13362va	16847va	
0300	0400	mtwhf	Bhutan, Bhutan BC Service	6035do					0300	0400			USA, KAIJ Dallas TX	5755va			
0300	0400	vl	Botswana, Radio	3356do	4820do	7255do			0300	0400			USA, KTBN Salt Lake City UT	7510na			
0300	0400		Bulgaria, Radio	7400na	9400na				0300	0400			USA, KWHR Naalehu HI	17510as			
0300	0400		Canada, CBC Northern Service	9625do					0300	0400			USA, Voice of America	6035af	6080af	7105af	7290af
0300	0400		Canada, CFRX Toronto ON	6070do									7340af	7415af	9575af	9885af	
0300	0400		Canada, CFVP Calgary AB	6030do					0300	0400			USA, WBCQ Monticello ME	7415na	9335na		
0300	0400		Canada, CHNX Halifax, NS	6130do					0300	0400			USA, WEWN Birmingham AL	5825va	7425na		
0300	0400		Canada, CKZN St John's NF	6160do					0300	0400			USA, WHRA Greenbush ME	7580na			
0300	0400		Canada, CKZU Vancouver BC	6160do					0300	0400			USA, WHRI Noblesville IN	7315sa			
0300	0400		Costa Rica, Foro del Caribe	5054ca	6175ca	9644ca			0300	0400			USA, WINB, Red Lion PA	12160am			
0300	0400		Costa Rica, R for Peace Intl	7480va	15048va				0300	0400			USA, WJCR Upton KY	7490va	13595as		
0300	0400		Costa Rica, University Network	5920al	6970va	7480va	15048va		0300	0400			USA, WRMI Miami FL	7385am			
			21815irr						0300	0400			USA, WSHB Cypress Crk SC	7535ue			
0300	0400		Cuba, Radio Havana	6000na	9820na	11705na			0300	0400			USA, WTJC Newport NC	9370na			
0300	0400		Ecuador, HCJB	9745na	11840na	21455usb			0300	0400			USA, WWCR Nashville TN	3215am	5070am	5935am	7435am
0300	0400	a/monthly	Finland, Scandv Weekend Radio	11690va	11720va				0300	0400			USA, WWFV McCoysville GA	3270va	5085		

Sunday		trends magazine (all other weeks)		nical topics (fortnightly)	
0300	WWCR(5070kHz.)	Communications World (Kim Elliott reviews the week in global communications)	0332	Voice of Russia	Moscow Mailbag (top-rated program with Joe Adamov answering listener questions and sharing Moscow's latest rumors and jokes)
0305	R. Australia	Correspondents' Report (ABC News reporters background international events)	0335	R. Budapest	Living in Germany (people, places and events)
0311	Voice of Russia	Moscow Mailbag (VOR's top-rated program in which Joe Adamov answers listener questions and talks about the latest rumors and jokes sweeping Moscow)	0340	R. Australia	The World in Sport (Dmitri Edwards presents world's sporting week with emphasis on NZ and Pacific)
0315	Deutsche Welle	Spectrum (a weekly programme looking at developments in the fields of science and technology)			Moscow Yesterday and Today (interesting history)
0320	China R. Int.	In the Spotlight (Chinese arts and cultural magazine)	0315	Radio Taipei Int.	Oz Country Style (country music from Australia)
0330	BBCWS(am)	Science in Action (Richard Black reports news from the worlds of science and technology)	0330	China R. Int.	From Our Own Correspondent (the background to international events)
	R. Australia	Feedback (Roger Broadbent answers listener questions and provides regular updates about RA)	0332	Voice of Russia	Money Matters (economic report on the Nordic region)
	R. Sweden	Weekend, magazine about Europe (1st week); Sweden Today George Wood presents voices of Sweden (2nd week); Spectrum, Bill Schiller on Swedish cultural scene (3rd week); Studio 49, ideas and long-term trends in the Nordic region (4th week)	0340	R. Australia	
	WWCR(5070kHz.)	World of Radio (Glenn Hauser's comprehensive review of the week in international broadcasting)	0345	BBCWS(am)	
0332	Voice of Russia	Songs from Russia (melodies from Russia's past)			
0340	R. Habana Cuba	DXers Unlimited (Arnie Coro presents a program from radio enthusiasts)			
Monday			Friday		
0300	R. Habana Cuba	Breakthrough (Arnie Coro with a report on science)	0305	R. New Zealand Int.	Dateline Pacific (major Pacific news stories, presented by Don Wiseman)
0305	R. New Zealand Int.	Tagata o te Moana (Anita Purcell presents a weekly Pacific magazine with NZ and regional Pacific news, issues, information and music)	0311	Voice of Russia	Science and Engineering (latest developments in science and technology)
0311	Voice of Russia	Moscow Mailbag (VOR's top-rated program in which Joe Adamov answers listener questions and talks about the latest rumors and jokes sweeping Moscow)	0330	China R. Int.	Life in China (focus on the lives of ordinary people)
0315	Deutsche Welle	Arts on the Air (Breandain O'Shea covers the German cultural scene)		Deutsche Welle	Spotlight on Sport (German and European sport)
0330	BBCWS(am)	Assignment (documentaries)		R. New Zealand Int.	Pacific Correspondent (RNZI's regional correspondents talk to Don Wiseman about political and social issues)
	R. Habana Cuba	From Havana (showcase of contemporary Cuban music)	0332	Voice of Russia	Russian by Radio (a language lesson)
	R. Sweden	In Touch with Stockholm presented by Nidia Hagström, an interactive listener contact program (1st weekend); Sounds Nordic presented by Gabv Katz' youth music and	0340	R. Australia	Musical Deli (folk, acoustic, traditional, world music)
			0345	BBCWS(am)	Analysis (background to the stories in the news)
				R. Sweden	Nordic Report, magazine on Scandinavia (1st week); Greenscan, Azariah Kiro highlights Swedish environmental awareness (2nd week); Heart Beat, Gabv Katz hosts health and medical magazine (3rd week); The S-Files, Kris Boswell on the Sweden behind the headlines (4th week)
Tuesday			Saturday		
0311	Voice of Russia	Science and Engineering (latest developments in science and technology)	0305	R. Australia	Rural Reporter (news and stories from regional Australia)
0315	Radio Taipei Int.	Taiwan Economic Journal	0311	Voice of Russia	Newmarker (Russian and international business)
0330	China R. Int.	Sports World (the sports scene in China and Asia)	0330	Deutsche Welle	German by Radio (a language lesson)
0332	Voice of Russia	Insight (a look at major international trends)		HCB Ecuador	Inspirational Classics (classical music selections inspired by religious and spiritual themes)
		Kaleidoscope (the latest economic, social and cultural events in Russia and the CIS)	0332	Voice of Russia	Audio Book Club (readings from Russian literature)
		Musical Deli (Folk, acoustic, traditional and world music)	0340	R. Australia	Lingua Franca (Jill Kirson presents language and its social, cultural and historical ramifications)
		Analysis (background to the news)	0345	BBCWS(am)	Analysis (background to the news)
Tuesday-Saturday					
0305	Deutsche Welle	Newslink (European current affairs magazine)			
0330	BBCWS(am)	World Business Report (main business issues of the day)			
	R. Sweden	Sixty Degrees North (reports, interviews and analysis)			
0335	R. Budapest	Hungary Today (a daily magazine covering current events)			
Wednesday					
0311	Voice of Russia	Newmarket (business and int'l business in Russia)			
0330	Deutsche Welle	Man and Environment (John Hay presents the human element in environmental issues)			
	R. New Zealand Int.	Tradewinds (Walter Zweifel's report on Pacific regional business and economic news)			
0340	R. Australia	Blacktracker (Mal Honess presents contemporary Aboriginal music)			
	R. Habana Cuba	DXers Unlimited presented by Arnie Coro			
0345	BBCWS(am)	Analysis (background to the news)			
	R. Sweden	Media Scan (the oldest program of its kind, George Wood on satellite and cyberspace communications, 1st and 3rd weeks)			
Thursday					
0305	R. New Zealand Int.	RNZI Talk, intro to the RNZI and National Radio staff, RNZI developments, projects and programs (fortnightly); Mailbag (program for the serious shortwave listener, with Nyma Oh, Paul Ormandy, and Adrian Sainsbury with letters, DX news, and tech-			



FREQUENCIES

0400 0427	Czech Rep, Radio Prague Intl	7345na	7385na	9435na	0400 0500	Singapore R Corp of Singapore	6150do		
0400 0430	Belgium, Radio Vlaanderen Intl	11985am			0400 0500 vl/as	Solomon Islands, SIBC	5020do		
0400 0430 stwhfa	Mexico, R Mexico International	9705am	11770am		0400 0500 vl/a	Solomon Islands, SIBC	9545do		
0400 0430	Mongolia, Voice of	12015as	12085as		0400 0500	Switzerland, Swiss R International	9885am	9905am	
0400 0430 vl	Nigeria, Radio/Kaduna	6090do	7275do		0400 0500	Turkey, Voice of	7240as	9655as	21715as
0400 0430	S Africa, Channel Africa	5955af			0400 0500	Uganda, Radio	4976do	5026do	
0400 0430	Sri Lanka, Sri Lanka BC Corp	6005as	6075as	6130do 9770as	0400 0500	UK, BBC World Service	3255af	5975na	6005af 6005af
		15425as					6135am	6175na	6190af 6195eu 7160af
0400 0445	Germany, Deutsche Welle	7195af	9565af	11935af 11965af			9410eu	11760me	11765af 12095af 15280as
0400 0455	USA, WYFR Okeechobee FL	6065na	9355eu	9505na			15310as	15420af	15575me 17760as 17790as
0400 0456	China China Radio International	9730na					21660as	21830me	
	Romania, R Romania International	9570na	11830na	15335as	0400 0500	Ukraine, R Ukraine International	9610na	9810na	9835na
		17735as	15335		0400 0500	USA, Armed Forces Radio	4278va	4319va	4993va 5765va
0400 0500	Anguilla, Caribbean Beacon	6090am					6350va	6458va	6847va 10320va 10940va
0400 0500 vl	Australia, ABC/Alice Springs	4835do					12579va	12689va	13362va 16847va
0400 0500 vl	Australia, ABC/Katherine	5025do			0400 0500	USA, KAJI Dallas TX	5755va		
0400 0500 vl	Australia, ABC/Tennant Creek	4910do			0400 0500	USA, KTBN Salt Lake City UT	7510na		
0400 0500	Australia, Christian Voice	9865va	15185va	17645va 21680va	0400 0500	USA, KVOH Los Angeles CA	9975am		
0400 0500	Australia, Radio	9660pa	12080pa	15240as 15415as	0400 0500	USA, KWHR Naalehu HI	17780as		
		15515va	17580va	21725va	0400 0500	USA, Voice of America	6080af	7170af	7290af 7415af
0400 0500 vl	Botswana, Radio	3356do	4820do	7255do			9575af	9775af	9885af 15205as
0400 0500 vl	Cameroon, RTV/Yaounde	4850do			0400 0500	USA, WBCQ Monticello ME	7415na	9335na	
0400 0500	Canada, CBC Northern Service	9625do			0400 0500	USA, WEWN Birmingham AL	5825va	7425na	
0400 0500	Canada, CFRX Toronto ON	6070do			0400 0500	USA, WHRA Greenbush ME	7580na		
0400 0500	Canada, CFPV Calgary AB	6030do			0400 0500	USA, WHRI Noblesville IN	7315a		
0400 0500	Canada, CHNX Halifax, NS	6130do			0400 0500	USA, WINB Red Lion PA	12160am		
0400 0500	Canada, CKZN St John's NF	6160do			0400 0500	USA, WJCR Upton KY	7490va	13595as	
0400 0500	Canada, CKZU Vancouver BC	6160do			0400 0500	USA, WMLK Bethel PA	7555va	9465alt	
0400 0500	Costa Rica, R for Peace Intl	7480va	15048va	15048va	0400 0500	USA, WRMI Miami FL	7385am		
0400 0500	Costa Rica, University Network	5920al	6970va	7480va 15048va	0400 0500	USA, WSHB Cypress Crk SC	7535eu	12020af	
0400 0500	Cuba, Radio Havana	6000na	9820na	11705na	0400 0500	USA, WTJC Newport NC	9370na		
0400 0500	Ecuador, HCJB	9745na	11840na	21455usb	0400 0500	USA, WWCN Nashville TN	2390am	3215am	5070am 5935am
0400 0500 a/monthly	Finland, Scandv Weekend Radio	11690va	11720va		0400 0500	USA, WWFV McCaysville GA	3270va	5085am	
0400 0500	Germany, Unt Methodist Church	11775af	13685af		0400 0500	Zambia, Christian Voice	6065do		
0400 0500	Germany, Voice of Hope	6185na			0400 0500 vl	Zambia, National BC Corp	6165do	6265do	
0400 0500 vl	Guatemala, Radio Cultural	3300do	5955do		0400 0500 vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do	
0400 0500	Guyana, Voice of	3289do	5949do		0425 0440	Italy, RAI International	6145af	7120af	
0400 0500	Kenya, Kenya BC Corp	4935do			0430 0457	Czech Rep, Radio Prague Intl	9865va	11600va	
0400 0500 vl	Lesotho, Radio	4800do			0430 0500	Iran, VOIRI	9830me	11985me	
0400 0500	Liberia, Voice of Hope	6280af			0430 0500	Netherlands, Radio	6165na	9590na	
0400 0500 vl	Malawi, Malawi BC Corp	3380do	5995do		0430 0500 vl	Nigeria, Radio/Ibadan	6050do		
0400 0500	Malaysia, Radio	7295do			0430 0500 vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do 9570do
0400 0500	Malaysia, Voice of Islam	6175as	9750as	15295as	0430 0500 vl	Nigeria, Radio/Lagos	3326do	4990do	
0400 0500	Myanmar, Radio	9730do			0430 0500	S Africa, Adventist World Radio	12080af		
0400 0500	Namibia, Namibian BC Corp	3270af	3289af		0430 0500	S Africa, Trans World Radio	6035af		
0400 0500	New Zealand, R New Zealand Intl	17675pa			0430 0500 mtwhfa	S Africa, Trans World Radio	4775af		
0400 0500	New Zealand, ZLX	3935do	7290do		0430 0500	Sri Lanka, Sri Lanka BC Corp	6130do		
0400 0500 vl	Nigeria, Radio/Enugu	6025do			0430 0500	Swaziland, Trans World Radio	4774af	6035af	
0400 0500 vl	Papua New Guinea, NBC	9675do	11880do		0445 0500	USA, WYFR Okeechobee FL	9355eu		
0400 0500	Russia, Voice of Russia WS	7125na	7180na	12000na 12020na					
		13665na	15445na	15470na 15595na 17595na					

SELECTED PROGRAMS

Sunday

0400	BBCWS(am)	The World Today (the BBC's agenda-setting flagship global news program)	China R. Int.
	R. Vlaanderen Int.	Music from Flanders (a half-hour of Flemish music, musicians and musical performances)	0432 Voice of Russia
	WHRI(5745kHz)	Dining with Cumbre (Marie Lamb with the hottest DX catches)	0435 R. Netherlands
0405	R. Australia	Ockham's Razor (sharp commentaries on scientific issues)	
	R. New Zealand Int.	Whenua! (Maori cultural magazine)	
	R. Prague	Readings from Czech Literature	
0410	HCJB Ecuador	DX Partyline (Allen Graham hosts a weekly program for DXers and SWLs)	
	R. Habana Cuba	The World of Stamps (this just might be the only program on radio on philatelic matters)	
	R. Prague	Saturday Music (Czech classical, folk, jazz or rock music)	
	Swiss R. Int.	The Name Game (prizes are offered to listeners who can identify the mystery Swiss location described)[1st Sun. of the month]	
0420	China R. Int.	In the Spotlight (Chinese arts and cultural magazine)	
0430	BBCWS(am)	Global Business (Peter Day charts the transformations sweeping through the world of work and commerce)	
	R. Australia	Oz Sounds (diverse music from Australian composers, performers and venues)	
0432	Voice of Russia	Kaleidoscope (the latest economic, social and cultural events in Russia and the CIS)	
0435	R. Netherlands	Europe Unzipped (the events of the past week in Europe, some unusual)	
0440	Swiss R. Int.	(repeat of the 0410 program)	

Monday

0400	BBCWS(am)	The World Today (the BBC's agenda-setting flagship global news program)	
	R. Vlaanderen Int.	Radio World (Frans Vossen presents a weekly report about international radio)	
0430	BBCWS(am)	Westway Compilation (an opportunity to hear again	

Monday-Friday

0405	R. New Zealand Int.	Checkpoint (RNZ National Radio's flagship evening news program)*	
0410	R. Australia	The World Today (a comprehensive current affairs program with Monica Attard and John Highfield)	

Tuesday

0405	BBCWS(am)	Omnibus (varied documentaries)	
0430	BBCWS(am)	Body and Mind (how health and medicine relate to you)[thru 21st Health Check a recurring series looking at global health and medicine issues.]	
	China R. Int.	Sports World (the sports scene in China and Asia)	

Tuesday-Saturday

0410	HCJB Ecuador	Studio 9 (daily magazine with focused reports on Latin America)	
0411	Voice of Russia	News and Views (Russian views on news developments)	
0430	R. Netherlands	Newsline (news, analysis and background reports)	
0445	BBCWS(am)	Off the Shelf (abridged serialized readings of novels, stories and other literature)	

Wednesday

0405	BBCWS(am)	The Alternative (the "cutting edge" of rock music)	
0430	BBCWS(am)	Patterns of Faith (a global exploration of religious values and human wisdom)[until 13/14 Food for Thought-foods that have strong connections with the soul or spirit, including 6/7th Canu, the sacred drink of Mazambique]	

Thursday

0405	BBCWS(am)	The Greenfield Collection (Edward Greenfield plays classical music requests and selections drawn from his own collection)	
0430	BBCWS(am)	Plain English (programs focusing on aspects of language)[thru 28/29 The E Files-what happens when English is used as an international language]	
	HCJB Ecuador	Ham Radio Today (Graham Bulmer hosts a program for radio amateurs)	

Friday

0405	BBCWS(am)	Jazzmatazz (this program has had a long run in this time slot, but BBC On Air's listings appear to hint that another program may appear here, at least temporarily)	
0430	BBCWS(am)	Heart and Soul (global religious and spiritual experiences)	
	China R. Int.	Life in China (a weekly magazine focusing on the lives of ordinary people in China)	

Saturday

0405	BBCWS(am)	Light Entertainment (a panel game or quiz show usually occupies this slot)	
	R. Australia	Pacific Focus-Environment (the past week's environmental news as reported on the weekday magazine, Pacific Beat)	
	R. New Zealand Int.	Tagata o te Moana (Anita Purcell presents a weekly Pacific magazine with NZ and regional Pacific news, issues, information and music)*	
0430	BBCWS(am)	Write On (Penny Vine sifts through the listener mail)	
	HCJB Ecuador	Waveguide (Richard Lambley with a monthly report of the latest broadcasting news)[aired the third or fourth week of the month in place of Write On]	
		Musica del Ecuador (Jorge Zambrano presents selections of Ecuadorian and Andean music)	

(*This RNZI program airs one hour UT later from March 18.)



FREQUENCIES

0500	0505		USA, WWCR Nashville TN	2390am	5070am	5935am				0500	0600	vl	Nigeria, Radio/Enugu	6025do					
0500	0505	sm	USA, WWCR Nashville TN	3210am						0500	0600	vl	Nigeria, Radio/Ibadan	6050do					
0500	0505	twhfa	USA, WWCR Nashville TN	3215am						0500	0600	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do		
0500	0515		Israel, Kol Israel	6280va	9435va	17545va				0500	0600	vl	Nigeria, Radio/Lagos	3326do	4990do				
0500	0530		Australia, Christian Voice	9865va	15185va	17645va	21680va			0500	0600	vl	Nigeria, Voice of	7255af	15120af				
0500	0530	twhfa	Mexico, R Mexico International	9705am	11770am					0500	0600	vl	Papua New Guinea, NBC	9675do	11880do				
0500	0530		Netherlands, Radio	6165na	9590na					0500	0600		Russia, Voice of Russia WS	7125na	7180na	12020na	15445na		
0500	0530		S Africa, Adventist World Radio	5960af	6015af								15470na 15595na						
0500	0530		S Africa, Channel Africa	15215af						0500	0600	mtwhta	Russia, Voice of Russia WS	12000na					
0500	0530		Switzerland, Swiss R International	9665eu						0500	0600	mtwhfs	S Africa, Trans World Radio	7200as					
0500	0530		Uganda, Radio	4976do	5026do					0500	0600		Singapore R Corp of Singapore	6150do					
0500	0530		Vatican City, Vatican Radio	9660af	11625af	15570af				0500	0600	vl	S Solomon Islands, SIBC	5020do	9545do				
0500	0530	vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do					0500	0600		Spain, R Exterior Espana	6055na					
0500	0545		Germany, Deutsche Welle	5960na	6120na	9670na	11795na			0500	0600		Sri Lanka, Sri Lanka BC Corp	6130do					
0500	0556		China China Radio International	9560na						0500	0600		Swaziland, Trans World Radio	6035af	7200af	9500af			
0500	0559		Canada, R Canada International	9760af	11850af	11905me				0500	0600		UK, BBC World Service	5975na	6005af	6175sam	6190af		
0500	0600		Anguilla, Caribbean Beacon	6090am									6195eu	7160af	9410e	9740as	11760me		
0500	0600	vl	Australia, ABC/Alice Springs	4835do									11765af	11940af	11955pa	12095eu	15280as		
0500	0600	vl	Australia, ABC/Katherine	5025do									15360as	15420as	15575me	17640af	17760as		
0500	0600	vl	Australia, ABC/Tennant Creek	4910do									17790as	21660as					
0500	0600		Australia, Radio	9660pa	12080pa	15240as	15515va			0500	0600		USA, Armed Forces Radio	4278va	4319va	4993va	5765va		
			17580va	21725va									6350va	6458va	6847va	10320va	10940va		
													12579va	12689va	13362va	16847va			
0500	0600	as	Australia, Radio	17750as						0500	0600		USA, KATJ Dallas TX	5755va					
0500	0600	vl	Botswana, Radio	3356do	4820do	7255do				0500	0600		USA, KTBN Salt Lake City UT	7510na					
0500	0600	vl	Cameroun, RTV/Yaounde	4850do						0500	0600		USA, KVOH Los Angeles CA	9975am					
0500	0600		Canada, CBC Northern Service	9625do						0500	0600		USA, KWHR Naalehu HI	11565pa	17780as				
0500	0600		Canada, CFRX Toronto ON	6070do						0500	0600		USA, Voice of America	5970af	6035af	6080af	7170af		
0500	0600		Canada, CFVP Calgary AB	6030do									7295af	9700af	9775af	11825eu	12080af		

SELECTED PROGRAMS

Sunday

0500	R. Netherlands	Sound Fountain (interesting topics explored with unique applications of sound)
0505	BBCWS(am)	Wright Around the World (Steve Wright puts the best e-mails, letters, answer machine messages and faxes on the air while playing musical requests)
	Deutsche Welle R. Australia	Talking Point (European journalists discuss the week's events) Pacific Review (the weekend edition of the daily regional magazine, Pacific Beat)
	R. New Zealand Int. Voice of Nigeria	Storytime (readings for children) * Link-Up (musical requests and dedications from around the African continent)
0510	R. Japan	Roundup Asia (interviews and reports highlighting various aspects of the rapidly changing Asian region)
0515	Deutsche Welle	Marks and Markets (DW's weekly financial magazine highlighting business in Europe)
0520	Spanish Foreign R.	American Chronicles (America from a Spanish perspective)
0530	China R. Int. R. Australia	In the Spotlight (Chinese arts and cultural magazine) In Conversation (Helen Brown talks with the leaders and characters of country Australia)
	Spanish Foreign R.	Spain in the American West (Spanish social and cultural influences on the western U.S.)
	WHR(5745kHz.) Voice of Russia	Dixing with Cumbre (Marie Lamb with the hottest DX catches) Moscow Yesterday and Today (recalling the most interesting events in the history of the city)
0540	R. Habana Cuba	DXers Unlimited (Amrie Corrao/arom from radio enthusiasts)

Monday

0500	R. Netherlands	Dutch Horizons (Bertine Krol chronicles life in Holland)
0505	Deutsche Welle	Religion and Society (an insight into religious events around the world)
0515	Deutsche Welle	Cool (Eric Gingerich and Anke Rasper present DW's youth magazine with reports on the attitudes, music and style of young Europe)
0530	Spanish Foreign R.	Entremeses (the food and sites in Spain's regions)
	China R. Int.	People in the Know (interviews with prominent Chinese who are shaping the nation's future)

Monday-Friday

0500	BBCWS(am)	The World Today (the BBC's agenda-setting flagship global news program)
	Voice of Nigeria	Wave Train (contemporary African tunes)
	WBCQ	Amos 'n Andy (the classic radio comedy from America's past)
0510	R. Australia	Pacific Beat (one of R.A.'s primary programs, this daily current events and features magazine focuses in on the Pacific island nations)
0515	R. Japan	44 Minutes (current affairs magazine about Japan and Asia)
0530	R. Habana Cuba	The Jazz Place (the very best of Cuban jazz)
	Voice of Nigeria	VON Scope (an in-depth roundup of the news in Nigeria, west Africa and the world)
0532	Voice of Russia	The Jazz Show (repeats from the Russian world of jazz)
0545	Spanish Foreign R.	Radio Club (a recording of Saturday's program)

Tuesday

0500	R. Netherlands	The Research File (a magazine emphasizing the relevance of science to all our lives)
0511	Voice of Russia	Moscow Mailbag (VOR's top-rated program in which Joe Adamov answers listener questions and talks about the latest rumors and jokes sweeping Moscow)
0530	China R. Int. Deutsche Welle	Sports World (the sports scene in China and Asia) Insight (a look at major international trends and developments)

Tuesday-Saturday

0500	Spanish Foreign R.	REE's News Service (featuring international, Ibero-American and national news in-depth, a review of the Spanish press, commentaries and analyses)
0505	Deutsche Welle	Newslink (daily current affairs magazine focused on Europe)
0545	Spanish Foreign R.	Spanish Language Course

Wednesday

0500	HCJB Ecuador	The Book and the Spade (the latest discoveries and developments in Biblical archaeology)
	R. Netherlands	Music 52/15 (Martha Hawley presents musical styles from around the globe)

0511	Voice of Russia	Science and Engineering (reports on the latest developments in science and technology)
0530	Deutsche Welle	Man and Environment (John Hay presents the human element in environmental issues)
0540	R. Habana Cuba	DXers Unlimited (Arnie Coro presents a program from radio enthusiasts)

Thursday

0500	R. Netherlands	The Weekly Documentary (RN's award-winning sound essays and in-depth investigations) <i>1750/3rd-A Prince in Pernambuco</i> -David Swaffling examines the rise of the Dutch slave trade in the 16 th century; <i>8th/10th-Dutch-Canadian History</i> -with Martha Hawley; <i>15th/17th-Sax, Saris and Screens</i> -Jonathan Groubert explains the formulas, rules and symbols of the immensely popular Indian film industry; <i>22nd/24th-Cinema Diaspora</i> -Jonathan Groubert looks at the influence of Indian films on Indians who have never lived in India.]
0511	Voice of Russia	Newmarket (news about business in Russia and Russia's involvement in international business)
0530	Deutsche Welle	Living in Germany (people, places and events in Germany)
0532	Voice of Russia	Folk Box (music drawn from the traditions of the hundreds of nationalities that make up Russia and the CIS)

Friday

0500	HCB Ecuador	Inspirational Classics (classical music selections inspired by religious and spiritual themes)
	R. Netherlands	Encore (republishing the best programs from RN's archives)
0511	Voice of Russia	Moscow Mailbag (see Tuesday's 0511 listing)
0530	China R. Int.	Life in China (a weekly magazine focusing on the lives of ordinary people in China)
	Deutsche Welle	Spotlight on Sport (weekly report on German and European sport)
	R. New Zealand Int.	The Pacific Report (a report on trends and events in the Pacific region)*

Continued on page 57



SELECTED PROGRAMS

(*This RNZI program airs one hour UT later from March 18.)

FREQUENCIES

0700	0705		New Zealand, R New Zealand Int'l	17675pa					0800	0810	vl	Malawi, Malawi BC Corp	3380do	5995do			
0700	0715	a	Greece, Voice of	9375uf	11900au	17520me			0800	0825		Malaysia, Voice of	6275as	9750as	15295as		
0700	0720	a	S Africa, Trans World Radio	7200af	9500af				0800	0827		Czech Rep, Radio Prague Intl	11600eu	15255eu			
0700	0720		Swaziland, Trans World Radio	6035af	7200af	9500af			0800	0830	vl	Australia, ABC/Alice Springs	4835do				
0700	0730	mtwhfa	Malta, Voice of Mediterranean	6010eu					0800	0830	vl	Australia, ABC/Katherine	5025do				
0700	0730	vl	Papua New Guinea, NBC	9675do	11880do				0800	0830	vl	Australia, ABC/Tennant Creek	4910do				
0700	0730		Slovakia, R Slovakia International	15460au	17550au	21705au			0800	0830		Belgium, Radio Vlaanderen Intl	5985eu				
0700	0730	a	USA, Voice of America	6873va					0800	0830		Myanmar, Radio	9730do				
0700	0735	mtwhf	S Africa, Trans World Radio	6035af	9500af				0800	0900		Anguilla, Caribbean Beacon	6090am				
0700	0745	as	UK, BBC World Service	17885af					0800	0900		Australia, Radio	5995pa	9580va	9710as	12080pa	
0700	0745		USA, WYFR Okeechobee FL	7355eu	9985eu	11850eu							13605va	15240va	15415as	17750as	
0700	0756		Romania, R Romania International	17720af	21480af								21725va				
0700	0800		Anguilla, Caribbean Beacon	6090am					0800	0900	mtwhf	Bhutan, Bhutan BC Service	6035do				
0700	0800	vl	Australia, ABC/Alice Springs	4835do					0800	0900	vl	Botswana, Radio	7255do	9600do	7255do		
0700	0800	vl	Australia, ABC/Katherine	5025do					0800	0900	vl	Cameron, RTV/Yaounde	4850do				
0700	0800		Australia, ABC/Tennant Creek	4910do					0800	0900		Canada, CFRX Toronto ON	6070do				
0700	0800		Australia, Radio	9660pa	12080pa	15240as	15415as		0800	0900		Canada, CFVP Calgary AB	6030do				
			17580va	17750as	21725va				0800	0900		Canada, CHNX Halifax, NS	6130do				
0700	0800	vl	Botswana, Radio	7255do	9600do	7255do			0800	0900		Canada, CKZN St John's NF	6160do				
0700	0800	vl	Cameron, RTV/Yaounde	4850do					0800	0900		Canada, CKZU Vancouver BC	6160do				
0700	0800		Canada, CFRX Toronto ON	6070do					0800	0900		Costa Rica, R for Peace Intl	15048va				
0700	0800		Canada, CFVP Calgary AB	6030do					0800	0900		Costa Rica, University Network	5920al	6970va	15048irr		
0700	0800		Canada, CHNX Halifax, NS	6130do					0800	0900		Ecuador, HCJB	9780eu	11755pa	21455usb		
0700	0800		Canada, CKZN St John's NF	6160do					0800	0900	mtwhf	Eqt Guinea, Radio Africa	15185af				
0700	0800		Canada, CKZU Vancouver BC	6160do					0800	0900	as/vl	Eqt. Guinea, Radio East Africa	15185af				
0700	0800		Costa Rica, R for Peace Intl	7480va	15048va	7480va	15048irr		0800	0900	a/monthly	Finland, Scandv Weekend Radio	11690va	11720va			
0700	0800		Costa Rica, University Network	5920al	6970va	7480va	15048irr		0800	0900		Germany, Deutsche Welle	6140eu				
0700	0800		Ecuador, HCJB	9780eu	11755pa	21455usb			0800	0900		Germany, Overcomer Ministries	13800pa	13810pa			
0700	0800	mtwhf	Eqt Guinea, Radio Africa	15185af					0800	0900		Germany, Trans World Radio	12070eu				
0700	0800	as/vl	Eqt. Guinea, Radio East Africa	15185af					0800	0900	vl	Germany, Voice of Hope	5975eu	21590me			
0700	0800	a/monthly	Finland, Scandv Weekend Radio	11690va	11720va				0800	0900	as	Ghana, Ghana BC Corp	3366do	4915do			
0700	0800		Germany, Deutsche Welle	6140eu					0800	0900		Gum, Trans World Radio	15200as	15330as			
0700	0800	as	Germany, Overcomer Ministries	9430pa	13810au				0800	0900	vl	Guyana, Voice of	3289do	5949do			
0700	0800		Germany, Trans World Radio	12070eu					0800	0900		Indonesia, Voice of	9525va	11785va	15149va		
0700	0800		Germany, Voice of Hope	5975eu	21590me				0800	0900	vl/as	Italy, IRRS	7120va				
0700	0800	vl	Ghana, Ghana BC Corp	3366do	4915do				0800	0900		Kenya, Kenya BC Corp	4935do				
0700	0800		Ghana, Ghana BC Corp	3366do	4915do				0800	0900	vl	Lesotho, Radio	4800do				
0700	0800	vl/mtwhf	Guyana, Voice of	3289do	5949do				0800	0900	vl	Liberia, ELWA	4760do				
0700	0800		Italy, IRRS	7120va					0800	0900	vl	Liberia, R Liberia International	5100do				
0700	0800		Kenya, Kenya BC Corp	4935do					0800	0900		Liberia, Voice of Hope	6280af				
0700	0800		Kuwait, Radio	15110va					0800	0900		Malaysia, Radio	7295do				
0700	0800	vl	Lesotho, Radio	4800do					0800	0900		Monaco, Trans World Radio	9870eu				
0700	0800	vl	Liberia, ELWA	4760do					0800	0900		Namibia, Namibian BC Corp	7165af	7215af			
0700	0800	vl	Liberia, R Liberia International	5100do					0800	0900		New Zealand, R New Zealand Int'l	15175pa				
0700	0800		Liberia, Voice of Hope	6280af					0800	0900	vl	New Zealand, ZLXA	3935do	7290do			
0700	0800	vl	Malawi, Malawi BC Corp	3380do	5995do				0800	0900	vl	Nigeria, Radio/Enugu	6025do				
0700	0800		Malaysia, Radio	7295do					0800	0900	vl	Nigeria, Radio/Ibadan	6050do				
0700	0800		Malaysia, RTM Sarawak	7160do					0800	0900	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	
0700	0800		Malaysia, Voice of	6275as	9750as	15295as			0800	0900	vl	Nigeria, Radio/Lagos	3326do	4990do	4990do		
0700	0800		Myanmar, Radio	9730do					0800	0900	vl	Palau, KHBN/Voice of Hope	9955as	9965as	9985as	15725as	
0700	0800		Namibia, Namibian BC Corp	3270af	3289af				0800	0900	vl	Papua New Guinea, NBC	4890do	9675do			
0700	0800	vl	New Zealand, ZLXA	3935do	7290do				0800	0900		Russia, Voice of Russia WS	9905au	15460au	15470au	17495au	
0700	0800	vl	Nigeria, Radio/Enugu	6025do									17525au	17570au	17655au		
0700	0800	vl	Nigeria, Radio/Ibadan	6050do					0800	0900	s	S Africa, Amateur Radio League	9750af				
0700	0800	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do		0800	0900		Sierra Leone, Sierra Leone BS	3316do				
0700	0800	vl	Nigeria, Radio/Lagos	3326do	4990do				0800	0900		Singapore R Corp of Singapore	6150do				
0700	0800		Palau, KHBN/Voice of Hope	9965as	9985as	15725as			0800	0900	vl	Solomon Islands, SIBC	5020do				
0700	0800		Russia, Voice of Russia WS	15460au	17570au	17655au	21790au		0800	0900		South Korea, R Kore Intl	9570va	13670va			
0700	0800		Sierra Leone, Sierra Leone BS	3316do					0800	0900		Sri Lanka, Sri Lanka BC Corp	6130do				
0700	0800	vl	Singapore R Corp of Singapore	6150do					0800	0900		Uganda, Radio	5026do	7110do	7196do		
0700	0800		Solomon Islands, SIBC	5020do					0800	0900		UK, BBC World Service	6190af	9410eu	9740as	11940af	
0700	0800		Sri Lanka, Sri Lanka BC Corp	6130do					0800	0900			11955pa	12095eu	15310as	15360as	
0700	0800		Taiwan, R Taiwan International	5950na	9680na	11745as			0800	0900	as	UK, BBC World Service	15575as	17885af			
0700	0800		Uganda, Radio	5026do	7110do	7196do			0800	0900		USA, Armed Forces Radio	4278va	4319va	4993va	5765va	
0700	0800		UK, BBC World Service	6175am	6190af	9410af	9580pa						15400af	15485eu	15565eu	17640eu	
			9740as	11760me	11765af	11940af	11955pa						17760as	17830af	21660as	21830me	
			12095eu	15310as	15360as	15400af	15485eu						17760as	17830af	21660as	21830me	
			15565eu	17640eu	17760as	17790as	17830af						17760as	17830af	21660as	21830me	
			21660as										15575as	17885af			
0700	0800		USA, Armed Forces Radio	4278va	4319va	4993va	5765va		0800	0900	as	UK, BBC World Service	15575as	17885af			
			6350va	6458va	6847va	10320va	10940va		0800	0900		USA, Armed Forces Radio	4278va	4319va	4993va	5765va	
			12579va	12689va	13362va	16847va							6350va	6458va	6847va	10320va	
0700	0800		USA, KAIJ Dallas TX	5755va									10940va	12579va	12689va	13362va	
0700	0800		USA, KTNB Salt Lake City UT	7510na									16847va				
0700	0800		USA, KWHR Naalele HI	11565pa	17780as												
0700	0800		USA, WEWN Birmingham AL	5825va	7425na												
0700	0800		USA, WHRA Greenbush ME	7435af													
0700	0800		USA, WHRI Noblesville IN	7315sa													
0700	0800		USA, WJCR Upton KY	7490va	13595as												
0700	0800		USA, WMLK Bethel PA	7555va	9465alt												
0700	0800		USA, WRMI Miami FL	7385am													
0700	0800		USA, WSHB Cypress Crk SC	7535af													
0700	0800		USA, WTJC Newport NC	9370na													
0700	0800		USA, WWCR Nashville TN	2390am	3210am	5070am	5935am										
0700	0800		USA, WWFV McCaysville GA	3270va	5085am												
0700	0800	vl	Vanuatu, Radio	3945do	4960do	7260do											
0700	0800		Zambia, Christian Voice	9865do													
0700	0800	vl	Zambia, National BC Corp	6165do	6265do												
0700	0800	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do												
0705	0800		New Zealand, R New Zealand Int'l	15175pa													
0710	0715	mtwhf	Vatican City, Vatican Radio	4005eu	5883eu	6185eu	9645eu										
				11740eu	15595eu												
0720	0735	smtwhf	Swaziland, Trans World Radio	6035af	7200af	9500af											
0730	0740	as	Guam, Trans World Radio	15330as													
0730	0758		Finland, YLE/R Finland	9510va	21670va												
0730	0800		Austria, R Austria International	6155eu	13730eu												
0730	0800	vl	Papua New Guinea, NBC	4890do	9675do												
0730	0800		Switzerland, Swiss R International	9885af	13635af	17665af						</					

FREQUENCIES

0900	0915	vl	Ghana, Ghana BC Corp	3366do	4915do				1000	1027	Vietnam, Voice of	9839as	12019as			
0900	0915		Guam, Trans World Radio	15200as	15330as				1000	1029	Czech Rep, Radio Prague Intl	21745va				
0900	0920		Monaco, Trans World Radio	9870eu					1000	1030	Guam, Adventist World Radio	15330as				
0900	0930		UK, BBC World Service	6195as	9605as	9740as	11760me		1000	1030	Singapore, RTE Radio	11740au				
			11765as	11945as	11955pa	12095eu	15190sa		1000	1030	Sri Lanka, Sri Lanka BC Corp	4940do				
			15310as	15360as	15400af	15485eu	15565eu		1000	1045	a	Austria, R Austria International	6155eu	13730eu		
			15575as	17640eu	17760as	17790as	17830af		1000	1056		China China Radio International	11675pa	11730pa	15210pa	
			17885af	21470af	21660as				1000	1100		Anguilla, Caribbean Beacon	11775am			
0900	0945		Germany, Deutsche Welle	6140eu	6160pa	11785af	12055as		1000	1100	vl	Australia, ABC/Alice Springs	2310do			
			15410af	17770va	17800af	17820pa	17845va		1000	1100	vl	Australia, ABC/Katherine	2485do			
			17860af	21560af					1000	1100	vl	Australia, ABC/Tennant Creek	2325do			
0900	0956		China China Radio International	11675pa	11730pa	15210pa			1000	1100		Australia, Radio	9580va	13605va	17750as	21820va
0900	1000		Anguilla, Caribbean Beacon	6090am					1000	1100	as	Bhutan, Bhutan BC Service	6035do			
0900	1000	vl	Australia, ABC/Alice Springs	2310do					1000	1100	vl	Botswana, Radio	7255do	9600do	7255do	
0900	1000	vl	Australia, ABC/Katherine	2485do					1000	1100	vl	Cameron, RTV/Yaounde	4850do			
0900	1000	vl	Australia, ABC/Tennant Creek	2325do					1000	1100		Canada, CFRX Toronto ON	6070do			
0900	1000		Australia, Radio	9580va	13605va	21820va			1000	1100		Canada, CFVP Calgary AB	6030do			
0900	1000	as	Australia, Radio	15400as	17750as				1000	1100		Canada, CHNX Halifax, NS	6130do			
0900	1000	vl	Botswana, Radio	7255do	9600do	7255do			1000	1100		Canada, CKZN St John's NF	6160do			
0900	1000	vl	Cameron, RTV/Yaounde	4850do					1000	1100		Canada, CKZU Vancouver BC	6160do			
0900	1000		Canada, CFRX Toronto ON	6070do					1000	1100		Costa Rica, R for Peace Intl	15048va			
0900	1000		Canada, CFVP Calgary AB	6030do					1000	1100		Costa Rica, University Network	5920af	6970va	15048irr	
0900	1000		Canada, CHNX Halifax, NS	6130do					1000	1100		Ecuador, HCJB	11755pa	21455usb		
0900	1000		Canada, CKZN St John's NF	6160do					1000	1100	mtwhf	Eat Guinea, Radio Africa	15185af			
0900	1000		Canada, CKZU Vancouver BC	6160do					1000	1100	as/vl	Eat Guinea, Radio East Africa	15185af			
0900	1000		Costa Rica, R for Peace Intl	15048va					1000	1100	a/monthly	Finland, Scandv Weekend Radio	11690va	11720va		
0900	1000		Costa Rica, University Network	5920af	6970va	15048irr			1000	1100		Germany, Deutsche Welle	6140eu			
0900	1000		Ecuador, HCJB	11775pa	21455usb				1000	1100		Germany, Voice of Hope	21590me			
0900	1000	mtwhf	Eat Guinea, Radio Africa	15185af					1000	1100	vl	Ghana, Ghana BC Corp	6130do	4915do		
0900	1000	as/vl	Eat Guinea, Radio East Africa	15185af					1000	1100	vl/as	Ghana, Ghana BC Corp	4915do	4915do		
0900	1000	a/monthly	Finland, Scandv Weekend Radio	11690va	11720va				1000	1100		Guam, Adventist World Radio	11660as			
0900	1000		Germany, Deutsche Welle	6140eu					1000	1100		Guyana, Voice of	5949do			
0900	1000	a	Germany, Good News World R	5985eu	5995eu				1000	1100		India, All India Radio	11585as	13700au	15020as	17485au
0900	1000		Germany, Trans World Radio	12070eu								17840au	17895au			
0900	1000		Germany, Voice of Hope	21590me					1000	1100	vl/as	Italy, IRRS	7120va			
0900	1000		Guyana, Voice of	3289do	5949do				1000	1100		Japan, Radio	9695as	15590as	21755pa	
0900	1000	vl/as	Italy, IRRS	7120va					1000	1100		Kenya, Kenya BC Corp	4935do			
0900	1000		Kenya, Kenya BC Corp	4935do					1000	1100	vl	Lesotho, Radio	4800do			
0900	1000	vl	Lesotho, Radio	4800do					1000	1100	vl	Liberia, ELWA	4760do			
0900	1000	vl	Liberia, ELWA	4760do					1000	1100	vl	Liberia, R Liberia International	6100do			
0900	1000	vl	Liberia, R Liberia International	6100do					1000	1100		Liberia, Voice of Hope	11530af			
0900	1000		Liberia, Voice of Hope	6280af					1000	1100		Malaysia, Radio	7295do			
0900	1000	s	Malaysia, Radio	7295do					1000	1100		Namibia, Namibian BC Corp	7165af	7215af		
0900	1000		Malta, Voice of Mediterranean	11770eu					1000	1100		Netherlands, Radio	7260va	9790va	12065va	
0900	1000		Namibia, Namibian BC Corp	7165af	7215af				1000	1100		New Zealand, R New Zealand Int'l	15175as			
0900	1000		New Zealand, R New Zealand Int'l	15175as					1000	1100		New Zealand, ZLXA	3935do			
0900	1000		New Zealand, ZLXA	3935do	7290do				1000	1100	vl	Nigeria, Radio/Enugu	6025do			
0900	1000	vl	Nigeria, Radio/Enugu	6025do					1000	1100	vl	Nigeria, Radio/Ibadan	6050do			
0900	1000	vl	Nigeria, Radio/Ibadan	6050do					1000	1100	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
0900	1000	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do		1000	1100	vl	Nigeria, Radio/Lagos	4990do	7285do		
0900	1000	vl	Nigeria, Radio/Lagos	3326do	4990do				1000	1100	vl	Nigeria, Voice of	7255af	15120af		
0900	1000		Palau, KHBN/Voice of Hope	9955as	9965as	9985as	15725as		1000	1100		Palau, KHBN/Voice of Hope	9955as	9965as	9985as	15725as
0900	1000	vl	Papua New Guinea, NBC	4890do	9675do				1000	1100	vl	Papua New Guinea, NBC	4890do	9675do		
0900	1000		Russia, Voice of Russia WS	9905au	15460au	15470au	17495au		1000	1100		Seirra Leone, Sierra Leone BS	5980do			
			17525au	17570au					1000	1100		Singapore R Corp of Singapore	6150do			
0900	1000		Sierra Leone, Sierra Leone BS	3316do					1000	1100	vl	Solomon Islands, SIBC	5020do			
0900	1000		Singapore R Corp of Singapore	6150do					1000	1100		Uganda, Radio	5026do	7110do	7196do	
0900	1000	vl	Solomon Islands, SIBC	5020do					1000	1100		UK, BBC World Service	6195va	9740as	11760me	11955pa
0900	1000		Sri Lanka, Sri Lanka BC Corp	6130do								12095eu	15310as	15360as	15485eu	
0900	1000		Uganda, Radio	5026do	7110do	7196do						15565eu	15575as	17640eu	17760as	
0900	1000	as	UK, BBC World Service	6190af	11940af				1000	1100	mtwhfa	17790as	21470af	21660as		
0900	1000		UK, Merlin Network One	6130eu					1000	1100	as	17885af				
0900	1000		USA, Armed Forces Radio	4278va	4319va	4993va	5765va		1000	1100	a	15190sa	15400af	17830af		
			6350va	6458va	6847va	10320va	10940va		1000	1100		UK, BBC World Service	6190af	11940af		
			12579va	12689va	13362va	16847va			1000	1100		UK, BBC World Service	6190af	11940af		
				5755va								4278va	4319va	4993va	5765va	
0900	1000		USA, KAIJ Dallas TX	7510na								6350va	6458va	6847va	10320va	
0900	1000		USA, KTNB Salt Lake City UT	7510na								10940va	12579va	12689va	13362va	
0900	1000		USA, KWHR Naalehu HI	11565pa	17780as							16847va				
0900	1000		USA, Voice of America	11995as	13615as	15150as						5755va				
0900	1000		USA, WEWN Birmingham AL	5825va	7425na				1000	1100		USA, KAIJ Dallas TX	7510na			
0900	1000		USA, WHRA Greenbush ME	7435af					1000	1100		USA, KTNB Salt Lake City UT	7510na			
0900	1000		USA, WHRI Noblesville IN	7315sa					1000	1100		USA, KWHR Naalehu HI	9930as	11565pa		
0900	1000		USA, WJCR Upton KY	7490va	13595as				1000	1100		USA, Voice of America	5985pa	6165ca	7370ca	9590ca
0900	1000		USA, WMLK Bethel PA	7555va	9475alt							11720as	15250as	15425as		
0900	1000		USA, WRMI Miami FL	7385am					1000	1100		USA, WEWN Birmingham AL	5825na	7425na	7465na	
0900	1000		USA, WSHB Cypress Crk SC	7535eu	9455sa				1000	1100		USA, WHRI Noblesville IN	6040na	9495sa		
0900	1000		USA, WTJC Newport NC	9370na					1000	1100		USA, WJCR Upton KY	7490va	13595as		
0900	1000		USA, WWCN Nashville TN	2390am	3210am	5070am	5935am		1000	1100		USA, WRMI Miami FL	9955am			
0900	1000	vl	Vanuatu, Radio	3945do	4960do	7260do			1000	1100		USA, WSHB Cypress Crk SC	6095am	9455sa		
0900	1000		Zambia, Christian Voice	9865do					1000	1100		USA, WTJC Newport NC	9370na			
0900	1000	vl	Zambia, National BC Corp	6165do	6265do				1000	1100		USA, WWCN Nashville TN	2390am	5070am	5935am	7435am
0900	1000	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do				1000	1100		USA, WYFR Okeechobee FL	5950na			
0910	0930	s	Armenia, Voice of	4810eu	15270eu				1000	1100	vl	Vanuatu, Radio	3945do	4960do	7260do	
0915	0930		Guam, Trans World Radio	15330as					1000	1100		Zambia, Christian Voice	9865do			
0915	1000	vl	Ghana, Ghana BC Corp	6130do	4915do				1000	1100	vl	Zambia, National BC Corp	6165do	6265do		
0915	1000	vl/as	Ghana, Ghana BC Corp	4915do	4915do				1000	1100	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do		
0920	0950	s	Monaco, Trans World Radio	9870eu					1030	1045	mtwhf	Ethiopia, Radio	5990do	7110do	9705do	
0930	1000	mtwhf	Guam, Trans World Radio	15330as					1030	1100		Malaysia, RTM Sarawak	7160do			
0930	1000		Italy, Adventist World Radio	9660eu					1030	1100		Mongolia, Voice of	12085au			
0930	1000		Netherlands, Radio	7260va	9790va	12065va			1030	1100		Sri Lanka, Sri Lanka BC Corp	4940do	11835as	15120as	17850as
0930	1000		UK, BBC World Service	6195as	9740as	11760me	11955pa		1030	1100		UAE, Radio Dubai	13675eu	15370eu	15395eu	21605eu
			12095eu	15190sa	15310as	15360as	15400af									
			15485eu	15565eu	15575as	17640eu	17760as									
			17790as	17830af	17885af	21470af	21660as									



1100	1105		Pakistan, Radio	17525eu	21460eu			1100	1200		Sierra Leone, Sierra Leone BS	5980do			
1100	1125		Netherlands, Radio	7260va	9790va	12065va		1100	1200		Singapore, R Singapore Intl	6150as	9600as		
1100	1127		Vietnam, Voice of	7285as				1100	1200		Switzerland, Swiss R International	9540as	21770as		
1100	1130		Sri Lanka, Sri Lanka BC Corp	4940do	11835as	15210as	17850as	1100	1200		Taiwan, Voice of Asia	7445as			
1100	1130		Switzerland, Swiss R International	9535eu				1100	1200		Uganda, Radio	5026do	7110do	7196do	
1100	1130	mtwhf	UK, BBC Caribbean Report	6195ca	15220ca			1100	1200	smtwhf	17885af				
1100	1130	as	UK, BBC World Service	6195na	15190sa	15220am		1100	1200	s	UK, BBC World Service	6190af	11940af		
1100	1200		Anguilla, Caribbean Beacon	11775am				1100	1200	as	UK, BBC World Service	5965na	6195va	9580as	9740as
1100	1200	vl	Australia, ABC/Alice Springs	2310do								11760me	11955as	12095eu	15220am
1100	1200	vl	Australia, ABC/Katherine	2485do								15280as	15310as	15400af	15485eu
1100	1200	vl	Australia, ABC/Tennant Creek	2325do								15565eu	15575as	17640eu	17700as
1100	1200		Australia, Radio	5995pa		9580va	12080pa					17830af	21470af		
				13605va	21820va							21455me	21515af		
1100	1200	vl	Botswana, Radio	7255do	9600do	7255do		1100	1200	a	UK, Flat Earth Radio/Merlin	21455me	21515af		
1100	1200	vl	Cameroon, RTV/Yaounde	4850do				1100	1200	a	UK, Virgin Radio/Merlin	21455me	21515af		
1100	1200		Canada, CFRX Toronto ON	6070do				1100	1200		UK, Armed Forces Radio	4278va	4319va	4993va	5765va
1100	1200		Canada, CFVP Calgary AB	6030do								6350va	6458va	6847va	10320va
1100	1200		Canada, CHNX Halifax, NS	6130do								10940va	12579va	12689va	13362va
1100	1200		Canada, CKZN St John's NF	6160do								16847va			
1100	1200		Canada, CKZU Vancouver BC	6160do				1100	1200		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
1100	1200		Costa Rica, R for Peace Intl	15048va								6350va	6458va	6847va	10320va
1100	1200		Costa Rica, University Network	15048irr	21815usb							10940va	12579va	12689va	13362va
1100	1200		Ecuador, HCJB	12005am	15115va	21455usb						16847va			
1100	1200	mtwhf	Eqt Guinea, Radio Africa	15185af				1100	1200		USA, KAIJ Dallas TX	5755va			
1100	1200	as/vl	Eqt. Guinea, Radio East Africa	15185af				1100	1200		USA, KTBN Salt Lake City UT	7510na			
1100	1200	a/monthly	Finland, Scandv Weekend Radio	11690va	11720va			1100	1200		USA, KWHR Naalehu HI	9930as	11565pa		
1100	1200		Germany, Deutsche Welle	6140eu	15410af	17800af	21780af	1100	1200		USA, Voice of America	5985pa	6110as	9645as	9760as
1100	1200		Germany, Voice of Hope	21590me								11705as	11720as	15250as	15425as
1100	1200	vl	Ghana, Ghana BC Corp	6130do	4915do			1100	1200		USA, WEWN Birmingham AL	5825na	7425na	15745na	
1100	1200	vl/as	Ghana, Ghana BC Corp	4915do	4915do			1100	1200		USA, WHRI Noblesville IN	6040na	9495sa		
1100	1200		Guyana, Voice of	5949do				1100	1200		USA, WJCR Upton KY	7490va	13595as		
1100	1200		Iran, VOIRI	15185as	15385as	15585as	21470as	1100	1200		USA, WRMI Miami FL	9955am			
				21730as				1100	1200		USA, WSHB Cypress Crk SC	6095am	11660va		

[illegible]



1200	1205		New Zealand, R New Zealand Intl	15175as				1200	1300	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
1200	1215		Somalia, Radio Galkayo	6985va				1200	1300	vl	Nigeria, Radio/Lagos	4990do	7285do		
1200	1220	fa	Kazakhstan, Radio Almaty	11840eu				1200	1300		Palau, KHBN/Voice of Hope	9955as	9965as	9985as	13840as
1200	1220	as	UK, BBC World Service	6190af	6195na	11940af	15220am	1200	1300	vl	Oapua New Guinea, NBC	4890do	9675do		
1200	1227		Iran, VOIRI	15185as	15385as	15585as	21470as	1200	1300		Sierra Leone, Sierra Leone BS	5980do			
				21730as				1200	1300		Singapore, R Singapore Intl	6150as	9600as		
1200	1230		Philippines, FEBC	15110as				1200	1300		Taiwan, R Taiwan International	7130as	9610au		
1200	1230		Sri Lanka, Sri Lanka BC Corp	4940do				1200	1300		Uganda, Radio	5026do	7110do	7196do	
1200	1230		Uzbekistan, Radio Tashkent	5060as	5975as	6025as	9715as	1200	1300		UK, BBC World Service	5965na	6195va	9515na	9580as
1200	1245		USA, WYFR Okeechobee FL	5950na	11830na	11970na					9740as	11760me	11955as	12095eu	
1200	1256		China China Radio International	9730as	9730as	9760pa	11675pa					15220am	15280as	15310as	15485eu
				11980as	15415as							15565eu	15575me	17640do	17700as
1200	1256		North Korea, R Pyongyang	3560va	9640va	9850va	9975va					17830af	17885af	21470af	
				11335va	13650va										
1200	1259		Canada, R Canada International	6150as				1200	1300	a	UK, Flat Earth Radio/Merlin	9430na	21515af		
1200	1300		Anguilla, Caribbean Beacon	11775am				1200	1300	a	UK, Virgin Radio/Merlin	21455me	21515af		
1200	1300	vl	Australia, ABC/Alice Springs	2310do				1200	1300		Ukraine, R Ukraine International	15520eu			
1200	1300	vl	Australia, ABC/Katherine	2485do				1200	1300		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
1200	1300	vl	Australia, ABC/Tennant Creek	2325do							6350va	6458va	6847va	10320va	
1200	1300		Australia, Radio	5995pa	6020va	9580va	11650pa				10940va	12579va	12689va	13362va	
				21820va							16847va				
1200	1300	vl	Botswana, Radio	7255do	9600do	7255do		1200	1300		USA, KAIJ Dallas TX	5755va			
1200	1300		Brazil, Radio Nacional Bras	15445am				1200	1300		USA, KTBN Salt Lake City UT	7510na			
1200	1300		Bulgaria, Radio	15700eu	17500eu			1200	1300		USA, KWHR Naalehu HI	9930as	11565pa		
1200	1300	vl	Cameroon, RTV/Yaounde	4850do				1200	1300		USA, Voice of America	6110as	9645as	9760as	11705as
1200	1300		Canada, CBC Northern Service	9625do							11715as	15250as	15425as		
1200	1300		Canada, CFRX Toronto ON	6070do				1200	1300		USA, WEWN Birmingham AL	5825na	7425na	15745na	
1200	1300		Canada, CFVP Calgary AB	6030do				1200	1300		USA, WHRI Noblesville IN	6040na	9495sa		
1200	1300		Canada, CHNX Halifax, NS	6130do				1200	1300		USA, WJCR Upton KY	7490va	13595as		
1200	1300		Canada, CKZN St John's NF	6160do				1200	1300		USA, WRMI Miami FL	9955am			
1200	1300		Canada, CKZU Vancouver BC	6160do				1200	1300		USA, WSHB Cypress Crk SC	6095am	11660va		
1200	1300		Costa Rica, R for Peace Intl	15048va	21815usb			1200	1300		USA, WTJC Newport NC	9370na			
1200	1300		Costa Rica, University Network	15048irr	21815usb			1200	1300		USA, WWCR Nashville TN	5070am	5935am	7435am	

MONITORING TIMES 53



1300	1320		Brazil, Radio Nacional Bras	15445am				1300	1400	as	S Africa, Channell Africa	11720af	17780af	21725af
1300	1325		Netherlands, Radio	6045eu	9855eu			1300	1400		Sierra Leone, Sierra Leone BS	5980do		
1300	1330		Egypt, Radio Cairo	17595as				1300	1400		Singapore, R Singapore Intl	6150as	9600as	
1300	1330	s	Germany, Universal Life	9710eu	9955na			1300	1400		South Korea, R Korea Intl	9570as	13670	om
1300	1330		Germnay, Voice of Hope	15715me				1300	1400		Sri Lanka, Sri Lanka BC Corp	4940do	6005as	6075as 9770as
1300	1330		Guam, Adventist World Radio	15225as							15425as			
1300	1330		Switzerland, Swiss R International	9535eu				1300	1400		Uganda, Radio	4976do	5026do	
1300	1356		China China Radio International	7405na	9570na	11675pa	11900pa	1300	1400		UK, BBC World Service	5965na	5995as	6190af 6195va
			11980as	15180as							9515na	9590na	9740as	11760me 11940a
1300	1356		Romania, R Romania International	11940eu	15290eu	15335na	17805na				12095eu	15220am	15310as	15420af 15485eu
1300	1359		Poland, Radio Polonia	6095eu	7270eu	9525eu	11820eu				15565eu	15575me	17640eu	17700as 17830af
1300	1400		Anguilla, Caribbean Beacon	11775am							17885af	21470af		
1300	1400	vl	Australia, ABC/Alice Springs	2310do				1300	1400	a	UK, Flat Earth Radio/Merlin	9430na	21455me	21515af
1300	1400	vl	Australia, ABC/Katherine	2485do				1300	1400	a	UK, Virgin Radio/Merlin	21455me	21515af	
1300	1400	vl	Australia, ABC/Tennant Creek	2325do				1300	1400		USA, Armed Forces Radio	4278va	4319va	4993va 5765va
1300	1400		Australia, Radio	5995pa	6020va	9580va	11650pa				6350va	6458va	6847va	10320va 10940va
			21820va								12579va	12689va	13362va	16847va
1300	1400	vl	Botswana, Radio	7255do	9600do	7255do		1300	1400		USA, KAIJ Dallas TX	5755va		
1300	1400	vl	Cameroon, RTV/Yaounde	4850do				1300	1400		USA, KNLS Anchor Point AK	9615as		
1300	1400		Canada, CBC Northern Service	9625do				1300	1400		USA, KTBN Salt Lake City UT	7510na		
1300	1400		Canada, CFRX Toronto ON	6070do				1300	1400		USA, KWHR Naalehu HI	9930as	11565pa	
1300	1400		Canada, CFVP Calgary AB	6030do				1300	1400		USA, Voice of America	6110as	9645as	9760as 11705as
1300	1400		Canada, CHNX Halifax, NS	6130do							11715as	15425as		
1300	1400		Canada, CKZN St John's NF	6160do				1300	1400		USA, WEWN Birmingham AL	11875va	15375na	15745na
1300	1400		Canada, CKZU Vancouver BC	6160do				1300	1400		USA, WHRI Noblesville IN	6040na	15105na	
1300	1400		Canada, R Canada International	9640na	13655na	17710na		1300	1400		USA, WJCR Upton KY	7490va	13595as	
1300	1400		Costa Rica, R for Peace Intl	15048va				1300	1400		USA, WRMI Miami FL	15725am		
1300	1400		Costa Rica, University Network	15048irr				1300	1400		USA, WSHB Cypress Crk SC	9430na	9455na	
1300	1400		Ecuador, HCJB	12005am	15115va	21455usb		1300	1400		USA, WTJC Newport NC	9070am		
1300	1400	as/vl	Eqt. Guinea, Radio East Africa	15185af				1300	1400		USA, WWCN Nashville TN	5307na	5935am	7435am 15685am
1300	1400	a/monthly	Finland, Scandv Weekend Radio	11690va	11720va			1300	1400		USA, WWFV McCaysville GA	12172va		
1300	1400		Germany, Deutsche Welle	6140eu				1300	1400	mtwhf	USA, WWFV McCaysville GA	9400va		
1300	1400		Germany, Overcomer Ministries	6110eu	13810af			1300	1400		USA, WYFR Okeechobee FL		11550as	11740na 11830na
1300	1400	vl	Ghana, Ghana BC Corp	4915do	6130do			</						

[illegible]



FREQUENCIES

1400 1405	Vatican City, Vatican Radio	15235au	17515au	1400 1500 vl	Nigeria, Radio/Enugu	6025do		
1400 1429	Czech Rep, Radio Prague Intl	21745va		1400 1500 vl	Nigeria, Radio/Ibadan	6050do		
1400 1430	Thailand, Radio	9530as		1400 1500 vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do 9570do
1400 1430	Turkey, Voice of	17690as	17815eu	1400 1500 vl	Nigeria, Radio/Lagos	4990do	7285do	
1400 1430 s	USA, Voice of America	18275va		1400 1500	Oman, Radio Sultanate of	15140va		
1400 1455 as	S Africa, Channel Africa	11720af	17780af 21725af	1400 1500	Palau, KHBN/Voice of Hope	9955as	9965as	9985as 13840as
1400 1456	China China Radio International	7180as	7405na 9700as 11675as	1400 1500	Sierra Leone, Sierra Leone BS	5980do		
		11765as	13685af 15125af	1400 1500	Singapore R Corp of Singapore	6150do		
1400 1500	Anguilla, Caribbean Beacon	11775am		1400 1500	Sri Lanka, Sri Lanka BC Corp	4940do	6005as	6075as 9770as
1400 1500 vl	Australia, ABC/Alice Springs	2310do				15425as		
1400 1500 vl	Australia, ABC/Katherine	2485do		1400 1500	Switzerland, Swiss R International	12010as	15185as	
1400 1500 vl	Australia, ABC/Tennant Creek	2325do		1400 1500	Taiwan, R Taiwan International	15125as		
1400 1500	Australia, Radio	5995as	6080pa 9580as 11650pa	1400 1500	Uganda, Radio	4976do	5026do	
		11660va		1400 1500	UK, BBC World Service	5995as	6190af	6195as 9590na
1400 1500 vl	Botswana, Radio	7255do	9600do 7255do			9740as	11940af	12095eu 15220na 15310as
1400 1500 vl	Cameroon, RTV/Yaounde	4850do				15485eu	15565eu	15575me 17640eu 17700as
1400 1500	Canada, CBC Northern Service	9625do				17830af	17840am	21470af 21660af
1400 1500	Canada, CFRX Toronto ON	6070do		1400 1500 a	UK, Flat Earth Radio/Merlin	15665na	21455me	21515af
1400 1500	Canada, CFVP Calgary AB	6030do		1400 1500 a	UK, Virgin Radio/Merlin	21455me	21515af	
1400 1500	Canada, CHNX Halifax, NS	6130do		1400 1500	USA, Armed Forces Radio	4278va	4319va	4993va 5765va
1400 1500	Canada, CKZN St John's NF	6160do				6350va	6458va	6847va 10320va 10940va
1400 1500	Canada, CKZU Vancouver BC	6160do				12579va	12689va	13362va 16847va
1400 1500	Canada, R Canada International	9640na	13655na 17710na	1400 1500	USA, KAIJ Dallas TX	13815va		
1400 1500	Costa Rica, R for Peace Intl	15048va	21815usb	1400 1500	USA, KJES Vado NM	11715na		
1400 1500	Costa Rica, University Network	15048irr	21815usb	1400 1500	USA, KTNB Salt Lake City UT	7510na		
1400 1500	Ecuador, HCJB	12005am	15115va 21455usb	1400 1500	USA, KWHR Naalehu HI	9930as	11565as	
1400 1500 as/vl	Eqt. Guinea, Radio East Africa	15185af		1400 1500	USA, Voice of America	6110as	7125as	9645as 9760as
1400 1500 a/monthly	Finland, Scandv Weekend Radio	11690va	11720va			15205as	15395as	15425as
1400 1500	France, R France International	11610as	17620as 17680af	1400 1500	USA, WEWN Birmingham AL	11875va	15375na	15745na
1400 1500	Germany, Deutsche Welle	6140eu		1400 1500	USA, WHRI Noblesville IN	6040na	15105na	
1400 1500	Germany, Overcomer Ministries	6110eu	13810af	1400 1500	USA, WJCR Upton KY	7490va	13595as	
1400 1500	Germany, Voice of Hope	15715me	17550as	1400 1500	USA, WRMI Miami FL	15725am		
1400 1500 vl	Ghana, Ghana BC Corp	4915do	6130do	1400 1500	USA, WTJC Newport NC	9370na		
1400 1500	Guyana, Voice of	5949do		1400 1500	USA, WWCN Nashville TN	9475am	12160am	13845am 15685am
1400 1500	India, All India Radio	9690as	11620as 13710as	1400 1500	USA, WWFV McCaysville GA	12172am		
1400 1500 vl/as	Italy, IRRS	7120va		1400 1500 mtwhf	USA, WWFV McCaysville GA	9400va		
1400 1500	Japan, Radio	7200as	9505as 9845as 11880va	1400 1500	USA, WYFR Okeechobee FL	11550as	11740na	11830na 17760na
1400 1500	Jordan, Radio	11690eu		1400 1500	Zambia, Christian Voice	9865do		
1400 1500	Kenya, Kenya BC Corp	4935do		1400 1500 vl	Zambia, National BC Corp	6165do	6265do	
1400 1500 vl	Lesotho, Radio	4800do		1400 1500 vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do	
1400 1500 vl	Liberia, ELWA	4760do		1415 1420	Nepal, Radio	5005as	7165as	
1400 1500 vl	Liberia, R Liberia International	6100do		1430 1500	Austria, R Austria International	6155eu	13730eu	17855au
1400 1500	Liberia, Voice of Hope	11530af		1430 1500	Guam, Adventist World Radio	15225as		
1400 1500	Malaysia, Radio	7295do		1430 1500	Guam, Trans World Radio	15330as		
1400 1500	Malaysia, RTM Sarawak	7160do		1430 1500	Malaysia, RTM Kota Kinabalu	5980do		
1400 1500	Namibia, Namibian BC Corp	7165af	7215af	1430 1500	Myanmar, Radio	5985do		
1400 1500 occsnal	New Zealand, R New Zealand Int	6095pa		1430 1500	Netherlands, Radio	12070as	12090as	15595as
1400 1500	New Zealand, ZLXA	3935do		1430 1500	Sweden, Radio	17505va	18960na	

SELECTED PROGRAMS

Daily

1400	BBCWS(am)	D	News
	China R. Int.	D	News
	R. Australia	D	R. News
	R. Canada Int.	D	CBC News
	R. Japan	D	News
	R. Prague	D	News

Sunday

1400	Channel Africa	Channel Africa Extra (continued from 1300)
1405	BBCWS(am)	Talking Point (where listeners and internet users can share their views on the issues of the day and put questions to expert guests)
	R. Australia	Books and Writing (Ramona Koval conducts in-depth discussions focusing on books, ideas and writing)
	R. Canada Int.	The Sunday Edition (continues from 1310 with a feature documentary)
1410	R. Japan	Roundup Asia (interviews and reports highlighting various aspects of the rapidly changing Asian region)
1420	China R. Int.	In the Spotlight (Chinese arts and cultural magazine)
1430	R. Sweden	In Touch with Stockholm (an interactive listener contact program presented the first weekend of each month by Nidia Hagström)
		Sounds Nordic (R. Sweden's youth music and trends magazine, presented by Gaby Katz every weekend of the month but the first.)

Monday

1405	BBCWS(am)	Meridian-Ideas (a series that explores "big" cultural ideas)
1430	BBCWS(am)	The Music Mix (insights into current popular music) [thru 28 th - Blues World-Tony Russell looks back at blues' heritage and plays the best of the new]
	China R. Int.	People in the Know (interviews with prominent Chinese who are shaping the nation's future)
1445	R. Sweden	Sports Scan (a weekly report on sports in the Nordic region)

Monday-Friday

1405	R. Australia	The Planet (continues from 1315)
	R. Canada Int.	This Morning (continues from 1310)
1415	R. Japan	44 Minutes (current affairs magazine about Japan and Asia)
1430	R. Sweden	Sixty Degrees North (reports, interviews and analysis on the Nordic region)

Tuesday

1405	BBCWS(am)	Meridian-Screen [thru 29 th - On Screen-a weekly report on international cinema]
1430	China R. Int.	Sports World (the sports scene in China and Asia)
1445	R. Sweden	Media Scan (the oldest program of its kind, George Wood now concentrates on satellite and cyberspace communications every first and third week)

Wednesday

1405	BBCWS(am)	Music Review (classical music news and features)
1430	BBCWS(am)	Westway (a radio soap opera)
1445	R. Sweden	Money Matters (a weekly economic report on the Nordic region)

Thursday

1405	BBCWS(am)	Meridian-Writing (reports on books, theatre, poetry, journalism, biography, history and anthropology) [thru 10 th - Writers on Location-Rosemary Harill meets authors who identify strongly with a particular part of Britain.]
		World of Music (the best of folk, non-Western classical and non-Western popular music)
1430	BBCWS(am)	Nordic Report (a monthly magazine on Scandinavia produced by the broadcasters of the Nordic region and broadcast the first week of the month)
		Greenscan (Azariah Kiros highlights Swedish environmental awareness and challenges the second week of the month)
1445	R. Sweden	Heart Beat (Gaby Katz hosts a monthly health and medical magazine, the third week of the month)
		The S-Files (Kris Boswell takes you to the Sweden behind the headlines, the fourth week of the month)

Friday

1405	BBCWS(am)	Meridian-Masterpiece (critical examinations of creative endeavors)
		Westway (a radio soap opera)
1430	BBCWS(am)	Life in China (a weekly magazine focusing on the lives of ordinary people in China)
	China R. Int.	Revolver (a guest musical artist gives a personal view on a selection of the best new releases from country to techno)
1445	BBCWS(am)	A Report on the Nordic Newsweek (the week's main news stories)
	R. Sweden	

Saturday

1400	Channel Africa	Channel Africa Extra (continued from 1300)
1405	BBCWS(am)	Sportsworld (live commentary on major sports events and fixtures, soccer scores and results from around Britain and Europe, and news of all the day's sporting action from around the world)
	R. Australia	New Dimensions (intimate conversations with many of this century's leading thinkers and social innovators)
	R. Canada Int.	Basic Black (Journalist, author, and humorist Arthur Black features people with unusual occupations, bizarre passions, and arcane obsessions, capped off with a quirky squint at the week's events in a closing monologue)
	R. Prague	Readings from Czech Literature
1410	R. Japan	Weekend Square (a program designed to present various aspects of Japan in a friendly and relaxed atmosphere with interviews, music and discussions)
	R. Prague	Saturday Music (Czech classical, folk, jazz or rock music)
1430	R. Sweden	Weekend (a magazine about Europe from the Radio E consortium, on the first week of the month)
		Sweden Today (George Wood presents the voices of Sweden, the second week of the month)
		Spectrum (Bill Schiller covers the Swedish cultural scene, the third week of the month)
		Studio 49 (conversations on ideas and long-term trends in Sweden and the Nordic region, the fourth week of the month)

FREQUENCIES

1500 1530	Ecuador, HCJB	21455usb	1500 1600 vl	Nigeria, Voice of	7255af	15120af	
1500 1530	Germany, Voice of Hope	15715me	1500 1600	Palau, KHBN/Voice of Hope	9955as	9965as	13840as
1500 1530	Jordan, Radio	11690eu	1500 1600	Russia, Voice of Russia WS	7180na	7315as	9800as 9875as
1500 1530	Mexico, R Mexico International	9705am		11500as			
1500 1530	Mongolia, Voice of	12015as	1500 1600	S Africa, World Beacon	6145af		
1500 1530	S Africa, Channel Africa	17770af	1500 1600 a	Seychelles, FEBA Radio	11600as		
1500 1556	China China Radio International	7160as	1500 1600	Sierra Leone, Sierra Leone BS	5980do		
	15125af	7405na	1500 1600	Singapore R Corp of Singapore	6150do		
	13760na	9335na	1500 1600	Sri Lanka, Sri Lanka BC Corp	4940do	6005as	6075as 9770as
1500 1559	Canada, R Canada International	9640na	1500 1600	Uganda, Radio	4976do	5026do	
1500 1600	Anguilla, Caribbean Beacon	11775am	1500 1600	UK, BBC World Service	5975as	5995as	6190af 6195as
1500 1600 vl	Australia, ABC/Alice Springs	2310do		9410eu	9515na	9590na	9740as 11860af
1500 1600 vl	Australia, ABC/Katherine	2485do		11940af	12095eu	15220na	15310as 15400af
1500 1600 vl	Australia, ABC/Tennant Creek	2325do		15420af	15485eu	15565eu	17700as 17830af
1500 1600	Australia, Radio	5995va		17840am	21470af	21490af	21660af
	11660va	6080pa	1500 1600 a	UK, Flat Earth Radio/Merlin	15665na	21455me	21515af
1500 1600 vl	Botswana, Radio	7255do	1500 1600 a	UK, Virgin Radio/Merlin	21455me	21515af	
1500 1600 vl	Cameroon, RTV/Yaounde	4850do	1500 1600	USA, Armed Forces Radio	4278va	4319va	4993va 5765va
1500 1600	Canada, CBC Northern Service	9625do		6350va	6458va	6847va	10320va 10940va
1500 1600	Canada, CFRX Toronto ON	6070do		12579va	12689va	13362va	
1500 1600	Canada, CFVP Calgary AB	6030do	1500 1600	USA, KAIJ Dallas TX	13815va		
1500 1600	Canada, CHNX Halifax, NS	6130do	1500 1600	USA, KJES Vado NM	11715na		
1500 1600	Canada, CKZN St John's NF	6160do	1500 1600	USA, KTBN Salt Lake City UT	7510na		
1500 1600	Canada, CKZU Vancouver BC	6160do	1500 1600	USA, KWHR Naalehu HI	9930as	11565pa	
1500 1600	Costa Rica, R for Peace Intl	15048va	1500 1600	USA, VOA Special English	6110as	9760as	9845as 12040as
1500 1600	Costa Rica, University Network	15048va		15460as	7125as	9575as	9645as 15205as
1500 1600	Ecuador, HCJB	12005am	1500 1600	USA, Voice of America	15395as		
1500 1600 as/vl	Egt. Guinea, Radio East Africa	15185af	1500 1600	USA, WEWN Birmingham AL	11875va	15375na	15745na
1500 1600 a/monthly	Finland, Scandy Weekend Radio	11690va	1500 1600	USA, WHRI Noblesville IN	6040na	15105na	
1500 1600	Germany, Deutsche Welle	6140eu	1500 1600	USA, WJCR Upton KY	7490va	13595as	
1500 1600	Germany, Overcomer Ministries	6110eu	1500 1600	USA, WRMI Miami FL	15725am		
1500 1600 vl	Ghana, Ghana BC Corp	4915do	1500 1600	USA, WTJC Newport NC	9370na		
1500 1600	Guam, Trans World Radio	15330as	1500 1600	USA, WWCR Nashville TN	9475am	12160am	13845am 15685am
1500 1600	Guyana, Voice of	5949do	1500 1600	USA, WWFV McCaysville GA	12172am		
1500 1600 vl/as	Italy, IRRS	7120va	1500 1600 mtwhf	USA, WWFV McCaysville GA	9400va		
1500 1600	Japan, Radio	7200as	1500 1600	USA, WYFR Okeechobee FL	11830na	17750na	17760na
1500 1600	Kenya, Kenya BC Corp	4935do	1500 1600 vl	Zambia, Christian Voice	4965do		
1500 1600 vl	Lesotho, Radio	4800do	1500 1600 vl	Zambia, National BC Corp	6165do	6265do	
1500 1600 vl	Liberia, ELWA	4760do	1500 1600 vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do	
1500 1600	Liberia, R Liberia International	6100do	1515 1600 vl	Malawi, Malawi BC Corp	3380do		
1500 1600	Liberia, Voice of Hope	11530af	1530 1545	Afghanistan, Voice of Shari'ah	7002do	7073do	7083as
1500 1600	Malaysia, Radio	7295do	1530 1545	Bangladesh, Bangla Betar	4882as	15520as	
1500 1600	Malaysia, RTM Kota Kinabalu	5980do	1530 1545 smtw	Seychelles, FEBA Radio	11600as		
1500 1600	Malaysia, RTM Sarawak	7160do	1530 1600 vl	Botswana, Radio	3356do	4820do	7255do
1500 1600	Myanmar, Radio	5985do	1530 1600	Germany, Voice of Hope	15715me		
1500 1600	Namibia, Namibian BC Corp	7165af	1530 1600	Iran, VOIR	7115as	9635as	11775na
1500 1600	Netherlands, Radio	12070as	1530 1600	Jordan, Radio	17680na		
1500 1600 occsnal	New Zealand, R New Zealand Int	6095pa	1530 1600	Slovakia, Adventist World Radio	13860as		
1500 1600	New Zealand, ZLXA	3935do	1545 1600 sh	Bangladesh, Bangla Betar	4882as	15520as	
1500 1600 vl	Nigeria, Radio/Enugu	6025do	1545 1600 smtw a	Seychelles, FEBA Radio	11600as		
1500 1600 vl	Nigeria, Radio/Ibadan	6050do	1550 1600	Vatican City, Vatican Radio	9865au	13765au	15235au
1500 1600 vl	Nigeria, Radio/Kaduna	4770do					
1500 1600 vl	Nigeria, Radio/Lagos	4990do					

SELECTED PROGRAMS

Daily

1500	BBCWS(am)	News
	China R. Int.	News
	R. Australia	RA News
	R. Canada Int.	CBC News
	Voice of Russia	News
1530	Voice of Russia	News in Brief

Sunday

1505	BBCWS(am)	From Our Own Correspondent (the background to international events from BBC correspondents around the world)
	R. Australia	Encounter (a highly acclaimed series exploring the connections between religion and life while reflecting on the religious experience of multicultural Australia)
	R. Canada Int.	The Sunday Edition (continues from 1310)
1520	China R. Int.	In the Spotlight (Chinese arts and cultural magazine)
1530	BBCWS(am)	People and Politics (inside British politics)
	WHRI(6040 kHz.)	Dixing with Cumbre (Marie Lamb with the hottest DX catches)
1532	Voice of Russia	Kaleidoscope (the latest economic, social and cultural events in Russia and the CIS)

Monday

1505	BBCWS(am)	One Planet (stories about the environment, development, agriculture and human impact on the natural world)
1530	BBCWS(am)	People and Places (a forum for the exchange of views and experiences on a global scale)
	China R. Int.	People in the Know (interviews with prominent Chinese who are shaping the nation's future)
	R. Australia	The Health Report (Dr. Norman Swan's weekly report on health and medical issues)
1532	Voice of Russia	Folk Box (music drawn from the traditions of the hundreds of nationalities that make up Russia and the CIS)
1545	R. Canada Int.	Out Front (a place for new ideas, new ways of making radio and new voices from across Canada)

Monday-Friday

1505	R. Australia	Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)
	R. Canada Int.	This Morning (continues from 1310)
1511	Voice of Russia	News and Views (Russian views on news developments)

Tuesday

1505	BBCWS(am)	Discovery (in-depth exploration of ideas and discoveries in science and technology)
1530	BBCWS(am)	Essential Guide (the biggest developments, issues and names in global affairs) [thru 13th: <i>Goodbye Village, Hello City</i> -John Pickford investigates the implication of the global migration from countryside to town]
	China R. Int.	Sports World (the sports scene in China and Asia)
	R. Australia	The Law Report (Susanna Lobez presents breaking legal stories in Australia and overseas)
1545	R. Canada Int.	Out Front (a place for new ideas, new ways of making radio and new voices from across Canada)

Wednesday

1505	BBCWS(am)	Health Matters (reports on research exploring where medicine is going) [thru 13th/14th: <i>20/20 Vision</i> -Sue Armstrong asks what should modern healthcare priorities be?]
1530	R. Australia	The Religion Report (John Cleary examines the way religion and societies interact)
1532	Voice of Russia	The Jazz Show (recordings from the Russian world of jazz)
1545	R. Canada Int.	Out Front (a place for new ideas, new ways of making radio and new voices from across Canada)

Thursday

1505	BBCWS(am)	Science View (the latest research put in a wider social context) [Both of the programs: <i>Seeing Stars</i> , about astronomy, and <i>Sundaybyte</i> , about computers, will be broadcast during the first and last weeks of the month.]
------	-----------	--

1530	BBCWS(am)	Focus on Faith (Trevor Barnes looks at the religious stories behind the news)
	R. Australia	The Media Report (Mick O'Regan takes a critical look at the latest developments in the communications industry)
1545	R. Canada Int.	Out Front (a place for new ideas, new ways of making radio and new voices from across Canada)

Friday

1505	BBCWS(am)	Sports International (the issues and personalities behind the headlines)
1530	BBCWS(am)	Pick of the World (Daire Brehan presents World Service highlights and talks with the producers and presenters of BBC programs)
	China R. Int.	Life in China (a weekly magazine focusing on the lives of ordinary people in China)
	R. Canada Int.	C'est La Vie (Bernard St-Laurent presents a program about life in Quebec and French-speaking Canada)
1532	Voice of Russia	Moscow Yesterday and Today (recalling the most interesting events in the history of the city)

Saturday

1505	BBCWS(am)	Sportsworld (continues from 1405)
	R. Australia	Melisma (Robyn Johnston weaves together chamber music, folk sources and jazz innovations in a graceful, melodic and sometimes challenging two hours)
	R. Canada Int.	Basic Black (continues from 1405)
1511	Voice of Russia	News and Views (Russian views on news developments)
1530	R. Australia	The Sports Factor (Amanda Smith presents reports which debate and celebrate the cultural significance of sport.)
	WHRI(6040 kHz.)	Dixing with Cumbre (Marie Lamb with the hottest DX catches)
1532	Voice of Russia	Timelines (Estelle Winters' variety show giving insight into life in Moscow through foreign eyes)



FREQUENCIES

1600 1610	Vatican City, Vatican Radio	9865au	13765au	15235au		1600 1700 vl	Nigeria, Radio/Enugu	6025do			
1600 1615	Pakistan, Radio	11570va	15100va	15725va	17720va	1600 1700 vl	Nigeria, Radio/Ibadan	6050do			
1600 1625	Netherlands, Radio	12070as	12095as	15595as		1600 1700 vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
1600 1627	Iran, VOIRI	7115as	9635as	11775na		1600 1700 vl	Nigeria, Radio/Lagos	3326do	4990do		
1600 1627	Vietnam, Voice of	7145eu	9730eu			1600 1700 vl	Nigeria, Voice of	7255af	15120af		
1600 1630	Ecuador, HCJB	12005am	15115va	21455usb		1600 1700	Palau, KHBN/Voice of Hope	9955as	9965as	13840as	
1600 1630 s	Germany, Universal Life	15105af				1600 1700	Russia, Voice of Russia WS	4940me	4965me	4975me	6005me
1600 1630	Guam, Trans World Radio	15330as					7180as	7305as	9830me		
1600 1630	Mexico, R Mexico International	9705am	11770am			1600 1700	S Africa, World Beacon	6145af			
1600 1630	S Africa, Channel Africa	9525af				1600 1700	Sierra Leone, Sierra Leone BS	5980do			
1600 1630 vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do			1600 1700	South Korea, R Korea Intl	5975am	9515va	9870va	
1600 1640	UAE, Radio Dubai	13675eu	15395eu	21605eu		1600 1700	Sri Lanka, Sri Lanka BC Corp	4940do			
1600 1645	Germany, Deutsche Welle	6170as	7225as	9735af	15380as	1600 1700	Uganda, Radio	4976do	5026do		
		15455af	17810as	21780af		1600 1700	UK, BBC World Service	3915as	5975as	6190af	6195as
1600 1650 occsnal	New Zealand, R New Zealand Int	6095pa					7160as	9410eu	9740eu	11940af	12095eu
1600 1656	China China Radio International	7190af	13650af				15210af	15310as	15420af	15565eu	17700as
1600 1656	North Korea, R Pyongyang	3560va	6520va	9660va	9975va		17830af	16740am	21470af	21660af	
1600 1700	Algeria, R Algiers International	11715va	15160va			1600 1700 mtwhfa	UK, BBC World Service	9515na			
1600 1700	Anguilla, Caribbean Beacon	11775am				1600 1700 a	UK, Flat Earth Radio/Merlin	15525eu	15665na	21515af	
1600 1700 vl	Australia, ABC/Alice Springs	2310do				1600 1700	UK, World Beacon	15455eu			
1600 1700 vl	Australia, ABC/Katherine	2485do				1600 1700	USA, Armed Forces Radio	4278va	4319va	4993va	5765va
1600 1700 vl	Australia, ABC/Tennant Creek	2325do					6350va	6458va	6847va	10320va	10940va
1600 1700	Australia, Radio	5995va	6080pa	9580va	9655va		12579va	12689va	13362va	16847va	
		11650pa				1600 1700	USA, KAIJ Dallas TX	13815va			
1600 1700 vl	Botswana, Radio	3356do	4820do	7255do		1600 1700	USA, KJES Vado NM	11715na			
1600 1700 vl	Cameroon, RTV/Yaounde	4850do				1600 1700	USA, KTBN Salt Lake City UT	15590na			
1600 1700	Canada, CBC Northern Service	9625do				1600 1700	USA, KWHR Naalehu HI	9930as			
1600 1700	Canada, CFRX Toronto ON	6070do				1600 1700	USA, VOA Special English	13600af	15445af	17895af	
1600 1700	Canada, CFVP Calgary AB	6030do				1600 1700	USA, Voice of America	6035af	6110as	7125as	9575as
1600 1700	Canada, CHNX Halifax NS	6130do					9645as	9760as	11920af	12040af	13710af
1600 1700	Canada, CKZN St John's NF	6160do					15205as	15225af	15240af	15395as	
1600 1700	Canada, CKZU Vancouver BC	6160do				1600 1700	USA, WEWN Birmingham AL	11875na	13615na	15375na	15745na
1600 1700	Costa Rica, R for Peace Intl	15048va	21815usb			1600 1700	USA, WHRA Greenbush ME	17650af			
1600 1700	Costa Rica, University Network	15048va	21815usb			1600 1700	USA, WHRI Noblesville IN	13760na	15105na		
1600 1700	Ethiopia, Radio	7165af	9560af			1600 1700	USA, WINB Red Lion PA	13570eu			
1600 1700 a/monthly	Finland, Scandy Weekend Radio	11690va	11720va			1600 1700	USA, WJCR Upton KY	7490va	13595as		
1600 1700	France, R France International	11615af	11995af	12015af	15210af	1600 1700	USA, WRMI Miami FL	15725am			
		17850af				1600 1700	USA, WSHB Cypress Crk SC	18910af			
1600 1700	Germany, Deutsche Welle	6140eu				1600 1700	USA, WTJC Newport NC	9370na			
1600 1700 a	Germany, Good News World R	15105af				1600 1700	USA, WWCN Nashville TN	9475am	12160am	13845am	15685am
1600 1700	Germany, Overcomer Ministries	6110eu	13810af			1600 1700	USA, WWFV McCaysville GA	12172am			
1600 1700 vl	Ghana, Ghana BC Corp	4915do	6130do			1600 1700 mtwhf	USA, WWFV McCaysville GA	9400va			
1600 1700	Guam, Adventist World Radio	11980as				1600 1700	USA, WYFR Okeechobee FL	11830na	15215na	17760na	18980eu
1600 1700 vl/as	Guyana, Voice of	5949do					21455eu	21525af			
1600 1700	Italy, IRRS	7120va				1600 1700	Zambia, Christian Voice	4965do			
1600 1700	Jordan, Radio	17680na				1600 1700 vl	Zambia, National BC Corp	6165do	6265do		
1600 1700	Kenya, Kenya BC Corp	4935do				1615 1630 as	UK, BBC World Service	11860af	21490af		
1600 1700 vl	Lesotho, Radio	4800do				1630 1700	Egypt, Radio Cairo	15255af			
1600 1700 vl	Liberia, ELWA	4760do				1630 1700 s	Seychelles, FEBA Radio	11605as			
1600 1700 vl	Liberia, R Liberia International	6100do				1630 1700	Somalia, Radio Galkayo	6985va			
1600 1700	Liberia, Voice of Hope	11530af				1630 1700 mtwhf	UK, Merlin Network One	12065as			
1600 1700 vl	Malawi, Malawi BC Corp	3380do				1630 1700 vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do		
1600 1700	Malaysia, Radio	7295do				1645 1700	Bangladesh, Bangla Betar	7184eu	7462eu	9550eu	15520eu
1600 1700	Namibia, Namibian BC Corp	7165af	7215af			1650 1700	New Zealand, R New Zealand Int	15120pa			
1600 1700	New Zealand, ZLXA	3935do									

SELECTED PROGRAMS

Daily

1600	R. Australia	RA News
1630	R. Austria Int.	Report from Austria (a daily magazine focusing on Austria and central and eastern Europe)

Sunday

1600	BBCWS(am)	News Summary
	WHRI(15105 kHz.)	Dixing with Cumbre (Marie Lamb with the hottest DX catches)
1601	BBCWS(am)	International Recital (a 16th series of chamber concerts from St. George's, Bristol, in the southwest of England with fifteen young musicians from eight countries performing music from some of the world's great musical traditions)
1605	R. Australia	The National Interest (Terry Lane's round-up of the week's major issues)
1635	R. Austria Int.	Radio E (a weekly magazine on Europe jointly produced by the BBC and other European broadcasters)

Monday

1630	BBCWS(am)	Analysis (background to the stories in the news)
------	-----------	--

Monday-Friday

1600	BBCWS(am)	World Briefing (a daily 20 minute report on the latest news)
1645	BBCWS(am)	Sports Roundup (all the daily sporting news worldwide)

Tuesday

1605	R. Australia	The Comfort Zone (Alan Saunders presents a unique program that debates and celebrates the cultural significance of architecture and design, landscape and gardens, and food)
------	--------------	--

1630 BBCWS(am)

Analysis (background to the stories in the news)

Wednesday

1605	R. Australia	Verbatim (a program that charts the story of the 20th century through the voices of ordinary Australians)
1630	BBCWS(am)	From Our Own Correspondent (the background to international events from BBC correspondents around the world)
	R. Australia	Earshot (a half-hour feature from the footpaths, paddocks, lounge rooms and shopping malls of the diverse Australian continent)

Thursday

1605	R. Australia	Hindsight (a documentary program that looks at Australian social history through the broad themes of institutions, popular culture, health and the environment)
1630	BBCWS(am)	Analysis (background to the stories in the news)

Friday

1605	R. Australia	Away! (Produced and presented by Aboriginal broadcasters, this is Australia's only national indigenous arts and culture program)
1630	BBCWS(am)	Analysis (background to the stories in the news)

Saturday

1600	BBCWS(am)	News
1605	BBCWS(am)	Sportsworld (continues from 1405)
	R. Australia	Melisma (continues from 1505)
1645	R. Austria Int.	Mailbag (Murray Hall and Bethany Bell read listeners' letters and respond to their questions)

Continued from page 48

0532	Voice of Russia	Audio Book Club (readings from the best of Russian classic and contemporary literature)
------	-----------------	---

Saturday

0500	BBCWS(am)	The World Today (the BBC's agenda-setting flagship global news program)
	R. Netherlands	A Good Life (how development affects societies)
	Voice of Nigeria	African Safari (exploring the roots of African musical styles)
	WBQC	Amos 'n Andy (the classic radio comedy from America's past)
0505	R. Australia	Pacific Focus-Sport (the week's sports news as reported on the daily magazine Pacific Beat)
	R. New Zealand Int.	Focus on Politics (a report on government and politics in NZ)*
0510	R. Japan	Hello from Tokyo (listener letters, music and short features)
0511	Voice of Russia	Science and Engineering (reports on the latest developments in science and technology)
0530	Deutsche Welle	German by Radio (a language lesson)
	R. Australia	Educational series (details not yet available at deadline)
	R. New Zealand Int.	In a Mellow Tone (Hayden Shirley plays relaxing and nostalgic music)*
0532	Voice of Russia	Timelines (Estelle Winters' variety show giving insight into life in Moscow through foreign eyes)
0535	Spanish Foreign R.	Radio Club (answering listeners' letters)
0545	Spanish Foreign R.	Radio Waves (a weekly program for radio enthusiasts)

(*This RNZI program airs one hour UT later from March 18.)

**1700
UTC**

**12:00 PM EST
11:00 AM CST
9:00 AM PST**

Shortwave Guide



**1:00 PM EST
12:00 PM CST
10:00 AM PST**

**1800
UTC**

FREQUENCIES

1700	1727	Czech Rep, Radio Prague Intl	5930eu	17485af	1800	1827	Czech Rep, Radio Prague Intl	5930eu	7315va
1700	1727	Vietnam, Voice of	12070eu		1800	1827	Vietnam, Voice of	7440eu	9730eu
1700	1730	France, R France International	11615af	15210af	1800	1830	Egypt, Radio Cairo	15255af	
1700	1730	Germany, Overcomer Ministries	6110eu		1800	1830	S Africa, Adventist World Radio	5960af	6100af
1700	1730	Jordan, Radio	17860na		1800	1830	S Africa, Channel Africa	17870af	
1700	1730	S Africa, Channel Africa	17870af		1800	1830	UK, BBC World Service	9410eu	5975sa
1700	1730	UK, Flat Earth Radio/Merlin	15525eu	15665na	1800	1830	UK, BBC World Service	15575me	6190af
1700	1730	UK, Merlin Network One	12065as		1800	1830			6195eu
1700	1730	China China Radio International	7150af	9570af	1800	1830			15400af
1700	1756		11910af	9670af	1800	1830			21470af
1700	1756	Romania, R Romania International	9795af		1800	1830	UK, RTE Radio	9895me	
1700	1800	Anguilla, Caribbean Beacon	9625eu	11740eu	1800	1859	Canada, R Canada International	11720af	13640af
1700	1800	Australia, ABC/Alice Springs	11775am	11940eu	1800	1859	Poland, Radio Polonia	5995eu	7285eu
1700	1800	Australia, ABC/Katherine	2310do		1800	1900	Anguilla, Caribbean Beacon	11775am	
1700	1800	Australia, ABC/Tennant Creek	2485do		1800	1900	Argentina, RAE	15345eu	
1700	1800	Australia, Radio	2325do		1800	1900	Australia, ABC/Alice Springs	2310do	
1700	1800		5995va	6080pa	1800	1900	Australia, ABC/Katherine	2485do	
1700	1800		11880va	9580va	1800	1900	Australia, ABC/Tennant Creek	2325do	
1700	1800	Bangladesh, Bangla Betar	7184eu		1800	1900	Australia, Radio	6080as	7240pa
1700	1800	Botswana, Radio	3356do	7462eu	1800	1900		11880va	9580va
1700	1800	Cameroon, RTV/Yaounde	4850do	4820do	1800	1900			9655va
1700	1800	Canada, CBC Northern Service	9625do		1800	1900	Botswana, Radio	3356do	4820do
1700	1800	Canada, CFRX Toronto ON	6070do		1800	1900	Cameroon, RTV/Yaounde	4850do	
1700	1800	Canada, CFVP Calgary AB	6030do		1800	1900	Canada, CBC Northern Service	9625do	
1700	1800	Canada, CHNX Halifax, NS	6130do		1800	1900	Canada, CFRX Toronto ON	6070do	
1700	1800	Canada, CKZN St John's NF	6160do		1800	1900	Canada, CFVP Calgary AB	6030do	
1700	1800	Canada, CKZU Vancouver BC	6160do		1800	1900	Canada, CHNX Halifax, NS	6130do	
1700	1800	Costa Rica, R for Peace Intl	15048va	21815usb	1800	1900	Canada, CKZN St John's NF	6160do	
1700	1800	Costa Rica, University Network	15048va	21815usb	1800	1900	Canada, CKZU Vancouver BC	6160do	
1700	1800	Egypt, Radio Cairo	15255af		1800	1900	Costa Rica, R for Peace Intl	15048va	21815usb
1700	1800	Eat Guinea, Radio Africa	15185af		1800	1900	Costa Rica, University Network	15048va	21815usb
1700	1800	Finland, Scandv Weekend Radio	11690va	11720va	1800	1900	Eat Guinea, Radio Africa	15185af	
1700	1800	Germany, Deutsche Welle	6140eu		1800	1900	Finland, Scandv Weekend Radio	11690va	11720va
1700	1800	Germany, Good News World R	11795me		1800	1900	Germany, Deutsche Welle	6140eu	
1700	1800	Germany, Voice of Hope	9495me		1800	1900	Germany, Unt Methodist Church	13810af	15485af
1700	1800	Germany, United Methodist Church	13810af	15485af	1800	1900	Germany, Voice of Hope	9495va	11735af
1700	1800	Ghana, Ghana BC Corp	3366do	4915do	1800	1900	Ghana, Ghana BC Corp	3366do	4915do
1700	1800	Greece, Voice of	7455na	9420eu	1800	1900	Guyana, Voice of	5949do	
1700	1800	Guyana, Voice of	5949do		1800	1900	India, All India Radio	7410as	9950as
1700	1800	Israel, K Israel	11605va	17545va	1800	1900		15200af	11620as
1700	1800	Japan, Radio	9505na	11970eu	1800	1900		17670af	11935as
1700	1800	Kenya, Kenya BC Corp	4935do	15355af	1800	1900	Italy, IRRS	3985va	
1700	1800	Lesotho, Radio	4800do		1800	1900	Kenya, Kenya BC Corp	4935do	
1700	1800	Liberia, ELWA	4760do		1800	1900	Kuwait, Radio	11990va	
1700	1800	Liberia, R Liberia International	6100do		1800	1900	Lesotho, Radio	4800do	
1700	1800	Liberia, Voice of Hope	11530af		1800	1900	Liberia, ELWA	4760do	
1700	1800	Malawi, Malawi BC Corp	3380do		1800	1900	Liberia, R Liberia International	5100do	
1700	1800	Malaysia, Radio	7295do		1800	1900	Liberia, Voice of Hope	11530af	
1700	1800	Namibia, Namibian BC Corp	3270af	3289af	1800	1900	Malawi, Malawi BC Corp	3380do	
1700	1800	New Zealand, R New Zealand Int	15120pa		1800	1900	Malaysia, Radio	7295do	
1700	1800	New Zealand, ZLXA	3935do		1800	1900	Namibia, Namibian BC Corp	3270af	3289af
1700	1800	Nigeria, Radio/Enugu	6025do		1800	1900	Netherlands, Radio	6020af	11655af
1700	1800	Nigeria, Radio/Ibadan	6050do		1800	1900	New Zealand, R New Zealand Int	15120pa	
1700	1800	Nigeria, Radio/Kaduna	4770do	6090do	1800	1900	New Zealand, ZLXA	3935do	
1700	1800	Nigeria, Radio/Lagos	3326do	7275do	1800	1900	Nigeria, Radio/Enugu	6025do	
1700	1800	Palau, KHBV/Voice of Hope	9955as	9570do	1800	1900	Nigeria, Radio/Ibadan	6050do	
1700	1800	Russia, Voice of Russia WS	7180me	13840as	1800	1900	Nigeria, Radio/Kaduna	4770do	6090do
1700	1800	S Africa, World Beacon	6145af		1800	1900	Nigeria, Radio/Lagos	3326do	7275do
1700	1800	Sierra Leone, Sierra Leone BS	5980do		1800	1900	Palau, KHBV/Voice of Hope	9955as	13840as
1700	1800	Sri Lanka, Sri Lanka BC Corp	4940do		1800	1900	Philippines, Radyo Pilipinas	11720me	17720me
1700	1800	Sudan, Radio Omdurman	7199do	9200do	1800	1900	Russia, Voice of Russia WS	5940eu	6045eu
1700	1800	Uganda, Radio	4976do	9505do	1800	1900	Russia, Voice of Russia WS	7340eu	9775eu
1700	1800	UK, BBC World Service	3255af	6005af	1800	1900		11510af	9890eu
1700	1800		6190af	15575me	1800	1900			
1700	1800		9630af		1800	1900	S Africa, Amateur Radio League	3215af	
1700	1800		17830af		1800	1900	S Africa, World Beacon	3230af	11640af
1700	1800	UK, World Beacon	15455eu		1800	1900	Sierra Leone, Sierra Leone BS	5980do	
1700	1800	USA, Armed Forces Radio	4278va	4319va	1800	1900	Sri Lanka, Sri Lanka BC Corp	4940do	
1700	1800		6458va	4993va	1800	1900	Swaziland, Trans World Radio	3200af	9500af
1700	1800		12579va	5765va	1800	1900	Taiwan, R Taiwan International	3955eu	
1700	1800	USA, KAIJ Dallas TX	13815va	10940va	1800	1900	Uganda, Radio	4976do	5026do
1700	1800	USA, KTNB Salt Lake City UT	15590na		1800	1900	UK, Merlin Network One	6130af	12065as
1700	1800	USA, KWHR Naalehu HI	9930as		1800	1900	UK, World Beacon	15585af	17665af
1700	1800	USA, Voice of America	6040af	6110as	1800	1900	USA, Armed Forces Radio	4278va	4319va
1700	1800		11920af	7125as	1800	1900		6458va	4993va
1700	1800		15455af	15205as	1800	1900		12579va	5765va
1700	1800	USA, Voice of America	5990as	9645as	1800	1900		12689va	16847va
1700	1800		9795as	15240af	1800	1900	USA, KAIJ Dallas TX	13815va	
1700	1800		11955as		1800	1900	USA, KTNB Salt Lake City UT	15590na	
1700	1800	USA, WEWN Birmingham AL	11875na		1800	1900	USA, KWHR Naalehu HI	9930as	
1700	1800	USA, WHRA Greenbush ME	17650af		1800	1900	USA, Voice of America	6035af	6040af
1700	1800	USA, WHRI Noblesville IN	13760sa	15105na	1800	1900		11920af	9565as
1700	1800	USA, WINB Red Lion PA	13570eu		1800	1900	USA, WEWN Birmingham AL	11875na	13710af
1700	1800	USA, WJCR Upton KY	7490va		1800	1900	USA, WHRA Greenbush ME	17650af	15580af
1700	1800	USA, WMLK Bethel PA	15265eu	13595as	1800	1900	USA, WHRI Noblesville IN	9495sa	13760na
1700	1800	USA, WRMI Miami FL	15725am		1800	1900	USA, WINB Red Lion PA	13570eu	
1700	1800	USA, WSHB Cypress Crk SC	18910af		1800	1900	USA, WJCR Upton KY	7490va	13595as
1700	1800	USA, WTJC Newport NC	9370na		1800	1900	USA, WMLK Bethel PA	15265eu	
1700	1800	USA, WWCR Nashville TN	9475am	12160am	1800	1900	USA, WRMI Miami FL	15725am	18910af
1700	1800	USA, WWFV McCaysville GA	12172am	13845am	1800	1900	USA, WSHB Cypress Crk SC	15665eu	
1700	1800	USA, WWFV McCaysville GA	9400va	15685am	1800	1900	USA, WTJC Newport NC	9370na	
1700	1800	USA, WYFR Okeechobee FL	18780eu		1800	1900	USA, WWCR Nashville TN	9475am	
1700	1800	Zambia, Christian Voice	4965do		1800	1900	USA, WWFV McCaysville GA	12172am	
1700	1800	Zambia, National BC Corp	6165do	6265do	1800	1900	USA, WWFV McCaysville GA	9400va	
1700	1800	Zimbabwe, Zimbabwe BC Corp	4828do	6045do	1800	1900	USA, WYFR Okeechobee FL	18780eu	
1700	1800	Vatican City, Vatican Radio	4005eu	5883eu	1800	1900	Yemen, Rep of Yemen Radio	9780do	
1715	1730		15595eu	7250eu	1800	1900	Zambia, Christian Voice	4965do	6265do
1725	1740	Armenia, Trans World Radio	5855me	9645eu	1800	1900	Zambia, National BC Corp	6165do	6045do
1725	1740	Germany, Trans World Radio	5855me		1800	1900	Zimbabwe, Zimbabwe BC Corp	4828do	
1725	1740	Monaco, Trans World Radio	6145me		1800	1900	Ascension Is, RTE Radio	21630af	
1730	1745	Ascension Is, United Nations Radio	17735va		1800	1900	Belgium, Radio Vlaanderen Intl	5910eu	9925eu
1730	1745	Libya, Voice of Africa	11815af	17725af	1800	1900	Canada, RTE Radio	13725na	13770me
1730	1745	S Africa, United Nations Radio	6125af		1800	1900	Mongolia, Voice of	12085as	
1730	1745	Swaziland, Trans World Radio	9500af		1800	1900	Netherlands, Radio	9895af	13700af
1730	1745	Swaziland, Trans World Radio	3200af		1800	1900	Sweden, Radio	6065va	17605af
1730	1745	UK, United Nations Radio	15495va		1800	1900	Sweden, Radio	6065va	
1730	1800	Guam, Adventist World Radio	7455as	11560me	1800	1900	UK, BBC World Service	3255af	6005af
1730	1800	Netherlands, Radio	6020af	11655af	1800	1900		9410eu	6190af
1730	1800	Philippines, Radyo Pilipinas	11720me	17720me	1800	1900		15575me	6195eu
1730	1800	S Africa, Adventist World Radio	12130af		1830	1900			15400af
1730	1800	Slovakia, R Slovakia International	5915eu	6055eu	1845	1900			15455af
1730	1800	Switzerland, Swiss R International	9605af	7345eu					
1730	1800	UK, BBC World Service	7385as	15555af					
1730	1800	UK, Merlin Network One	12065as	11660as					
1730	1800	Vatican City, Vatican Radio	13765af	17515af					
1735	1745	Paraguay, Radio Nacional	9739sa						
1745	1800	India, All India Radio	7410eu	9950as					
1745	1800		13750af	11620eu					
1745	1800		15200af	11935as					
1745	1800	Swaziland, Trans World Radio	3200af	9500af					

FREQUENCIES

1900	1915		Congo, RTV Congolaise	5985do			
1900	1927		Vietnam, Voice of	7145eu	9730eu		
1900	1930		Iran, VOIRI	7255me	7750me		
1900	1930		Philippines, Radio Pilipinas	11720me	15190me	17720pa	
1900	1945		Germany, Deutsche Welle	11765af	11810af	13610af	15135af
			15390af	17810af			
1900	1945		India, All India Radio	13790af	9950as	11620as	11935as
				15200af	7410as		
1900	1950		New Zealand, R New Zealand Int	15120pa			
1900	1956		China China Radio International	6165af	9440af	9585af	
1900	2000		Anguilla, Caribbean Beacon	11775am			
1900	2000		Australia, ABC/Katherine	2485do			
1900	2000	vl	Australia, ABC/Tennant Creek	2325do			
1900	2000		Australia, Radio	6080as	7240pa	9500as	9580va
			9815as	11880va			
1900	2000	vl	Botswana, Radio	3356do	4820do		
1900	2000	vl	Cameroon, RTV/Yaounde	4850do			
1900	2000		Canada, CFRX Toronto ON	6070do			
1900	2000		Canada, CFVP Calgary AB	6030do			
1900	2000		Canada, CHNX Halifax, NS	6130do			
1900	2000		Canada, CKZN St John's NF	6160do			
1900	2000		Canada, CKZU Vancouver BC	6160do			
1900	2000		Canada, CBC Northern Service	9625do			
1900	2000		Costa Rica, R for Peace Intl	15048va	21815usb		
1900	2000		Costa Rica, University Network	15048va	21815usb		
1900	2000		Ecuador, HCJB	17660eu			
1900	2000		Egt Guinea, Radio Africa	15185af			
1900	2000		Finland, Scandv Weekend Radio	11690va	11720va		
1900	2000		Germany, Overcomer Ministries	17870na			
1900	2000		Germany, Voice of Hope	7290eu	11735af		
1900	2000	vl	Ghana, Ghana BC Corp	3366do	4915do		
1900	2000	s	Greece, Voice of	7455eu	17565sa	17705na	
1900	2000	vl	Italy, IRRS	3985va			
1900	2000		Kenya, Kenya BC Corp	4935do			
1900	2000		Kuwait, Radio	11990va			
1900	2000	vl	Lesotho, Radio	4800do			
1900	2000	vl	Liberia, ELWA	4760do			
1900	2000	vl	Liberia, R Liberia International	5100do			
1900	2000		Liberia, Voice of Hope	11530af			
1900	2000	vl	Malawi, Malawi BC Corp	3380do			
1900	2000		Malaysia, Radio	7295do			
1900	2000		Namibia, Namibian BC Corp	3270af	3289af		
1900	2000		Netherlands, Radio	6020af	11655af	13700af	17605af
1900	2000		New Zealand, ZLXA	3935do			
1900	2000	vl	Nigeria, Radio/Enugu	6025do			
1900	2000	vl	Nigeria, Radio/Ibadan	6050do			
1900	2000	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
1900	2000	vl	Nigeria, Radio/Lagos	3326do	4990do		
1900	2000	vl	Nigeria, Voice of	7255af	15120af		
1900	2000		North Korea, R Pyongyang	4405va	6574na	9335na	11710na
			13760na				
1900	2000		Russia, Voice of Russia WS	5940eu	5950eu	6045eu	7205eu
			7340eu	9775eu	9875af	9890eu	11510af
1900	2000		Russia, World Beacon	7360eu			
1900	2000		S Africa, World Beacon	3230af	11640af		
1900	2000		Sierra Leone, Sierra Leone BS	3316do			
1900	2000	vl	Solomon Islands, SIBC	5020do			
1900	2000		South Korea, R Korea Intl	5975om	7275eu		
1900	2000		Sri Lanka, Sri Lanka BC Corp	4940do			
1900	2000	irreg a	Sri Lanka, Sri Lanka BC Corp	6010eu			
1900	2000		Swaziland, Trans World Radio	3200af			
1900	2000		Thailand, Radio	9535eu			
1900	2000		Uganda, Radio	4976do	5026do		
1900	2000		UK, BBC World Service	3255af	6005af	6190af	6195af
			9410eu	9630af	9740pa		6195af
			17830af				15575as
1900	2000	a	UK, BBC World Service	17840na			
1900	2000	hf	UK, Merlin Network One	6130af			
1900	2000		UK, World Beacon	9675eu	15585eu		
1900	2000		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
			6350va	6458va	6847va	10320va	10940va
			12579va	12689va	13362va	16847va	
1900	2000		USA, KAIJ Dallas TX	13815va			
1900	2000		USA, KJES Vado NM	15385na			
1900	2000		USA, KTBN Salt Lake City UT	15590na			
1900	2000		USA, KWHR Naalehu HI	9930as			
1900	2000		USA, VOA Special English	9785me	12015me	13640me	
1900	2000		USA, Voice of America	4950af	6035af	7415af	9525pa
			9690as	9760as	11920af	11975af	
			13710af				
1900	2000		USA, WEWN Birmingham AL	11875na	13615na	15375na	15745na
1900	2000		USA, WHRA Greenbush ME	17650af			
1900	2000		USA, WHRI Noblesville IN	9495sa	13760na		
1900	2000		USA, WINB Red Lion PA	13570eu			
1900	2000		USA, WJCR Upton KY	7490va	13595as		
1900	2000		USA, WMLK Bethel PA	15265eu			
1900	2000		USA, WRMI Miami FL	15725am			
1900	2000		USA, WSHB Cypress Crk SC	15665eu	18910af		
1900	2000		USA, WTJC Newport NC	9370na			
1900	2000		USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1900	2000		USA, WWFV McCoyville GA	12172am			
1900	2000	mtwhf	USA, WWFV McCoyville GA	9400va			
1900	2000		USA, WYFR Okeechobee FL	18980eu			
1900	2000		Zambia, Christian Voice	4965do			
1900	2000	vl	Zambia, National BC Corp	6165do	6265do		
1900	2000	vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do		
1915	1925		Rwanda, Radio	6055do			
1930	1955		Greece, Voice of	7475eu	9375eu		
1930	2000		Austria, R Austria International	5945eu	6155eu		
1930	2000		Iran, VOIRI	6110eu	7215eu	7255eu	9022eu
1930	2000	vl	Papua New Guinea, NBC	4890do			
1930	2000		Slovakia, R Slovakia International	5915eu	6055eu	7345eu	
1930	2000		Switzerland, Swiss R International	9605af	11910af	13660af	
1930	2000		Turkey, Voice of	6140as	7240as		
1935	1955		Italy, RAI International	5975eu	7285eu	9760eu	
1945	2000		Albania, R Tirana International	7210eu	9510eu		
1950	2000		New Zealand, R New Zealand Int	17675pa			

2000	2015		Swaziland, Trans World Radio	3200af			
2000	2025		Netherlands, Radio	6020af	11655af	13700af	17605af
2000	2027		Iran, VOIRI	6110eu	7215eu	7255eu	9022eu
2000	2030		Hungary, Radio Budapest	6025eu	7135eu		
2000	2030		Israel, Kol Israel	6280va	9435va	15640va	15650va
2000	2030		Mongolia, Voice of	12015eu	12085eu		
2000	2030		Switzerland, Swiss R International	6165af	9605af	11910af	13660af
			13790af				
2000	2030		Turkey, Voice of	6140as	7240as		
2000	2030		USA, Voice of America	4950af	6035af	6095as	7415af
			9690as	9760as	11855af	11975af	13710af
			15240af	15580af	17725af	17885af	
2000	2030		Vatican City, Vatican Radio	9660af	11625af	13765af	
2000	2045		Germany, Deutsche Welle	9725eu			
2000	2045		Iraq, Radio Iraq International	9684va	11785va		
2000	2056		China China Radio International	5965eu	9440af	9840eu	11735af
			13640af				
2000	2100		Algeria, R Algiers International	11715eu	15160eu		
2000	2100		Anguilla, Caribbean Beacon	11775am			
2000	2100	vl	Australia, ABC/Alice Springs	2310do			
2000	2100	vl	Australia, ABC/Katherine	2485do			
2000	2100	vl	Australia, ABC/Tennant Creek	2325do			
2000	2100		Australia, Radio	9500as	9580va	9815as	11880va
			12080pa				
2000	2100	as	Australia, Radio	6080as	7240pa		
2000	2100	vl	Botswana, Radio	3356do	4820do		
2000	2100		Bulgaria, Radio	7200eu	7500eu		
2000	2100	vl	Cameroon, RTV/Yaounde	4850do			
2000	2100		Canada, CBC Northern Service	9625do			
2000	2100		Canada, CFRX Toronto ON	6070do			
2000	2100		Canada, CFVP Calgary AB	6030do			
2000	2100		Canada, CHNX Halifax, NS	6130do			
2000	2100		Canada, CKZN St John's NF	6160do			
2000	2100		Canada, CKZU Vancouver BC	6160do			
2000	2100		Costa Rica, R for Peace Intl	15048va	21815va		
2000	2100		Costa Rica, University Network	15048va	15065va	21815usb	
2000	2100		Ecuador, HCJB	17660eu			
2000	2100	mtwhf	Eqt Guinea, Radio Africa	15185af			
2000	2100	a/monthly	Finland, Scandv Weekend Radio	11690va	11720va		
2000	2100		Germany, Voice of Hope	7290me	11735af		
2000	2100	vl	Ghana, Ghana BC Corp	3366do	4915do		
2000	2100		Indonesia, Voice of	9525va	11785va	15149va	
2000	2100	vl	Italy, IRKS	3985va			
2000	2100		Kenya, Kenya BC Corp	4935do			
2000	2100		Kuwait, Radio	11990va			
2000	2100	vl	Kuwait, Radio	11990va			
2000	2100	vl	Liberia, ELWA	4760do			
2000	2100	vl	Liberia, R Liberia International	5100do			
2000	2100	vl	Malawi, Malawi BC Corp	3380do			
2000	2100		Malaysia, Radio	7295do			
2000	2100	mtwhfa	Malta, Voice of Mediterranean	7440eu			
2000	2100	namibia	Namibia BC Corp	3270af	3289af		
2000	2100		New Zealand, R New Zealand Int	17675pa			
2000	2100		New Zealand, ZLAA	3935do	7290do		
2000	2100	vl	Nigeria, Radio/Enugu	6025do			
2000	2100	vl	Nigeria, Radio/Ibadan	6050do			
2000	2100	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
2000	2100	vl	Nigeria, Radio/Lagos	3326do	4990do		
2000	2100	vl	Nigeria, Voice of	7255af	15120af		
2000	2100	vl	Papua New Guinea, NBC	4890do			
2000	2100		Russia, Voice of Russia WS	5940eu	5950eu	6045eu	7340eu
				9775eu	9890eu		
2000	2100		Russia, World Beacon	7360eu			
2000	2100		S Africa, World Beacon	3230af	11640af		
2000	2100		Sierra Leone, Sierra Leone BS	3316do			
2000	2100	vl	Solomon Islands, SIBC	5090do			
2000	2100	mtwhf	Spain, R Exterior Espana	9595af	9680eu		
2000	2100	irreg	Sri Lanka, Sri Lanka BC Corp	4940do			
2000	2100	vl	Syria, Radio Damascus	12085eu	13610eu		
2000	2100		Uganda, Radio	4976do	5026do		
2000	2100		UK, BBC World Service	3255af	5975pa	6005af	6190af
				6195eu	9410eu	9630af	9740pa
				11835af	15400af	17830af	
2000	2100		UK, World Beacon	9675af			
2000	2100		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
				10940va	6458va	6847va	10320va
				16847va	12579va	12689va	13362va
2000	2100		USA, KAJI Dallas TX	13815va			
2000	2100		USA, KJES Vado NM	15385us			
2000	2100		USA, KTNB Salt Lake City UT	15590na			
2000	2100		USA, KWHR Naalehu HI	1751as			
2000	2100		USA, WERN Birmingham AL	11875na	13615na	15375na	15745na
2000	2100		USA, WHRA Greenbush ME	17650af			
2000	2100		USA, WHRI Noblesville IN	5745as	9495sa	13760na	
2000	2100		USA, WINB Red Lion PA	13970eu			
2000	2100		USA, WJCR Upton KY	7490eu	13595as		
2000	2100		USA, WMLK Bethel PA	15265eu			
2000	2100		USA, WRMI Miami FL	15725am			
2000	2100		USA, WTJC Newport NC	9370na			
2000	2100		USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
2000	2100		USA, WWVF Mcaysville GA	12172am			
2000	2100	mtwhf	USA, WWVF Mcaysville GA	9400va			
2000	2100		USA, WYFR Okeechobee FL	7355eu	15565eu		
2000	2100	vl	Vanuatu, Radio	3945do	4960do	7260do	
2000	2100		Zambia, Christian Voice	4963do			
2000	2100	vl	Zambia, National BC Corp	6350do	6265do		
2000	2100	vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do		
2000	2100		USA, WSHB Cypress Crk SC	11550eu	15665af		
2025	2045		Italy, RAI International	7220af	9710af	11880af	
2030	2045	vl	Libya, Voice of Africa	11815af	17725af		
2030	2045		Thailand, Radio	9535eu			
2030	2057		Vietnam, Voice of	7145eu	9730eu		
2030	2100	t h	Belarus, R Belarus International	7105eu	7210as		
2030	2100		Cuba, Radio Havana	13660eu	13750eu		
2030	2100		Egypt, Radio Cairo	15375af			
2030	2100		Germany, Adventist World Radio	9015af			
2030	2100		Ireland, Radio Polaris	6030eu	7185eu	7265eu	9540eu
2030	2100		S Africa, Adventist World Radio	9745af			
2030	2100		Sweden, Radio	6065va	9445va		
2030	2100		USA, Voice of America	6035af	6095as	7415af	9690as
				9760as	11975af	13710af	15240af
				15580af	17725af	17885af	
2030	2100	as	USA, Voice of America	4950af			
2030	2100		Uzbekistan, Radio Tashkent	7105eu	9540eu		
2040	2050	m	Vatican City, Vatican Radio	9645eu			
2040	2100	mtwhfa	Armenia, Voice of	4810eu			
2045	2100		India, All India Radio	7150eu	7410eu	9650eu	9910ou
				9950eu	11620ou	11715ou	
2050	2100		Vatican City, Vatican Radio	4005eu	5883eu	7250eu	
2050	2100	m	Vatican City, Vatican Radio	9645eu			



FREQUENCIES

2100	2110	Kenya, Kenya BC Corp	4935do		
2100	2110	Vatican City, Vatican Radio	4005eu	5883eu	7250eu
2100	2127	Czech Rep, Radio Prague Intl	5930va	9430va	
2100	2129	Poland, Radio Polonia	6030eu	7185eu	7265eu 9540eu
2100	2130	Australia, ABC/Alice Springs	2310do		
2100	2130	Australia, ABC/Katherine	2485do		
2100	2130	Australia, ABC/Tennant Creek	2325do		
2100	2130	Australia, Radio	7240pa	9500as	9580va 9660pa
			12080pa	17715va	21740va
2100	2130	China China Radio International	5965eu	9840eu	11735af
2100	2130	Cuba, Radio Havana	13660eu	13750eu	
2100	2130	UK, BBC World Service	5975ca		
2100	2145	Germany, Deutsche Welle	9615af	9690af	9765va 15135va
			17560va	17835af	
2100	2156	North Korea, R Pyongyang	6574va	9335va	
2100	2156	Romania, R Romania International	5955eu	7195eu	7215eu 9690eu
2100	2159	Canada, R Canada International	5995eu	7235eu	9770eu 9805eu
			13650eu		
2100	2200	Angola, R. Nacional de Angola	3374va	4950va	7245va
2100	2200	Anguilla, Caribbean Beacon	11775am		
2100	2200	Botswana, Radio	3356do	4820do	
2100	2200	Cameroon, RTV/Yaounde	4850do		
2100	2200	Canada, CBC Northern Service	6625do		
2100	2200	Canada, CFRX Toronto ON	6070do		
2100	2200	Canada, CFVP Calgary AB	6030do		
2100	2200	Canada, CHNX Halifax, NS	6130do		
2100	2200	Canada, CKZN St John's NF	6160do		
2100	2200	Canada, CKZU Vancouver BC	6160do		
2100	2200	Costa Rica, R for Peace Intl	15048va	21815va	
2100	2200	Costa Rica, University Network	15048va	15065va	21815usb
2100	2200	Ecuador, HCJB	17660eu		
2100	2200	Egypt, Radio Cairo	15375af		
2100	2200	Eqt Guinea, Radio Africa	15185af		
			Finland, Scandv Weekend Radio		11690va
2100	2200	Ghana, Ghana BC Corp	3366do	4915do	
2100	2200	India, All India Radio	7150au	7410eu	9650eu 9910au
			9950eu	11620au	
2100	2200	Italy, IRRS	3985va	6180eu	11830eu 11855af
2100	2200	Japan, Radio	6115eu		
			21670pa		
2100	2200	Lesotho, Radio	4800do		
2100	2200	Liberia, ELWA	4760do		
2100	2200	Liberia, R Liberia International	5100do		
2100	2200	Malawi, Malawi BC Corp	3380do		
2100	2200	Malaysia, Radio	7295do		
2100	2200	Namibia, Namibian BC Corp	3270af	3289af	
2100	2200	New Zealand, R New Zealand Int	17675pa		
2100	2200	New Zealand, ZLX	3935do		
2100	2200	Nigeria, Radio/Enugu	6025do		
2100	2200	Nigeria, Radio/Ibadan	6050do		
2100	2200	Nigeria, Radio/Kaduna	4770do	6090do	7275do 9570do
2100	2200	Nigeria, Radio/Lagos	3326do	4990do	
2100	2200	Palau, KHBN/Voice of Hope	9985as		
2100	2200	Papua New Guinea, NBC	4890do		
2100	2200	Russia, Voice of Russia WS	5940eu	5950eu	6045eu 7300eu
			7340eu	9890eu	
2100	2200	Russia, World Beacon	7360eu		
2100	2200	S Africa, World Beacon	3230af	11640af	
2100	2200	Sierra Leone, Sierra Leone BS	3316do		
2100	2200	Solomon Islands, SIBC	5020do	9545do	
2100	2200	South Korea, R Korea Intl	15575eu		
2100	2200	Sri Lanka, Sri Lanka BC Corp	4940do		
2100	2200	Syria, Radio Damascus	12085eu	13610eu	
2100	2200	UK, BBC World Service	3255af	3915as	5965as 5975pa
			6005af	6190af	6195va 9410eu
			9740pa	11835af	15400af
2100	2200	UK, World Beacon	9675af		
2100	2200	USA, Armed Forces Radio	4278va	4319va	4993va 5765va
			6350va	6847va	10320va 10940va
			12579va	13362va	16847va
2100	2200	USA, KAIJ Dallas TX	13815va		
2100	2200	USA, KTNB Salt Lake City UT	15590na		
2100	2200	USA, KWHR Naalehu HI	17510as		
2100	2200	USA, Voice of America	6035af	6040me	6095as 7415af
			9595as	9670as	11870pa 11975af
			13710af	15185pa	15240af 15580af
			17735pa	17820as	17725af
2100	2200	USA, WBCQ Monticello ME	7415na		
2100	2200	USA, WEWN Birmingham AL	9975na	11875na	13615na 15375na
2100	2200	USA, WHRA Greenbush ME	17650af		
2100	2200	USA, WHRI Noblesville IN	5745na	9495sa	13760na
2100	2200	USA, WINB Red Lion PA	13570eu		
2100	2200	USA, WJCR Upton KY	7490va	13595as	
2100	2200	USA, WMLK Bethel FL	15265as		
2100	2200	USA, WRMI Miami FL	15725am		
2100	2200	USA, WSHB Cypress Crk SC	11550eu	15665af	
2100	2200	USA, WTJC Newport NC	9370na		
2100	2200	USA, WWCR Nashville TN	7435am	9475am	12160am 13845am
2100	2200	USA, WWFV McCaysville GA	12172va		
2100	2200	USA, WWFV McCaysville GA	9320va		
2100	2200	USA, WYFR Okeechobee FL	7355eu	15565af	21525af
2100	2200	Vanuatu, Radio	3945do	4960do	7260do
2100	2200	Zambia, Christian Voice	4965do		
2100	2200	Zambia, National BC Corp	6165do	6265do	
2100	2200	Zimbabwe, Zimbabwe BC Corp	4828do	6045do	
2115	2130	UK, BBC Caribbean Report	5975ca	11675ca	15390ca
2115	2200	Egypt, Radio Cairo	9990eu		
2120	2200	Greece, Voice of	9420au	15650au	
2130	2145	UK, Wales Radio Intl/Merlin	6010eu		
2130	2145	UK, BBC Colling Falklands	11680sa		
2130	2156	China, China Radio International	5965eu	9840eu	
2130	2200	Australia, ABC/Alice Springs	4835do		
2130	2200	Australia, ABC/Katherine	5025do		
2130	2200	Australia, ABC/Tennant Creek	4910do		
2130	2200	Australia, Radio	7240pa	9660pa	11880va 12080pa

2130	2200	th	Belarus, R Belarus International	17715va	21740va	
2130	2200		Guam, Adventist World Radio	7105eu	7210as	
2130	2200		Iran, VOIRI	11960as	11980as	
2130	2200		Turkey, Voice of	9780va	11740va	
2130	2200		Uzbekistan, Radio Tashkent	9525eu		
				9540eu		

2200

2200	2210	vl	Malawi, Malawi BC Corp	3380do		
2200	2210	vl	Zambia, National BC Corp	6165do	6265do	
2200	2220	s	Greece, Voice of	9420au	15650au	
2200	2225		Italy, RAI International	9675as	11900as	15240as
2200	2227		Iran, VOIRI	9780va	11740va	
2200	2230		Hungary, Radio Budapest	6025eu		
2200	2230		Hungary, Radio Budapest	6025eu		
2200	2230		India, All India Radio	7150au	7410eu	9650eu 9910eu
			9950eu	11620au	11715au	
2200	2230		Mexico, R. Mexico International	9705am	11770am	
2200	2230	vl	Papua New Guinea, NBC	4890do		
2200	2230		South Korea, R Korea Intl	3975eu		
2200	2230		Turkey, Voice of	9525as		
2200	2230	mtwhf	USA, Voice of America	6035af	7415af	11655af 11975af
			13710af			
2200	2245		Egypt, Radio Cairo	9990eu		
2200	2245		USA, WYFR Okeechobee FL	7580eu	11740na	15565af 21525af
2200	2256		China China Radio International	7170eu		
2200	2259		Canada, R Canada International	11705as		
2200	2300		Anguilla, Caribbean Beacon	6090am		
2200	2300	vl	Australia, ABC/Alice Springs	4835do		
2200	2300	vl	Australia, ABC/Katherine	5025do		
2200	2300	vl	Australia, ABC/Tennant Creek	4910do		
2200	2300		Australia, Radio	11715va	17795va	21740va
2200	2300		Bulgaria, Radio	7200eu	7500eu	
2200	2300	vl	Cameroon, RTV/Yaounde	4850do		
2200	2300		Canada, CBC Northern Service	9625do		
2200	2300		Canada, CFRX Toronto ON	6070do		
2200	2300		Canada, CFVP Calgary AB	6030do		
2200	2300		Canada, CHNX Halifax, NS	6130do		
2200	2300		Canada, CKZN St John's NF	6160do		
2200	2300		Canada, CKZU Vancouver BC	6160do		
2200	2300		Costa Rica, R for Peace Intl	15048va	15065va	21815usb
2200	2300		Costa Rica, University Network	15048va	15065va	21815usb
2200	2300	mtwhf	Eqt Guinea, Radio Africa	15185af		
2200	2300	f/monthly		Finland, Scandv Weekend Radio		11690va
			11720va			
2200	2300	vl	Ghana, Ghana BC Corp	3366do	4915do	
2200	2300	vl	Italy, IRRS	3985va		
2200	2300	vl	Liberia, R Liberia International	5100do		
2200	2300		Malaysia, Radio	7295do		
2200	2300		Namibia, Namibian BC Corp	3270af	3289af	
2200	2300		New Zealand, R New Zealand Int	17675pa		
2200	2300		New Zealand, ZLXA	3935do		
2200	2300	vl	Nigeria, Radio/Enugu	6025do		
2200	2300	vl	Nigeria, Radio/Ibadan	6050do		
2200	2300	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do 9570do
2200	2300	vl	Nigeria, Radio/Lagos	3326do	4990do	
2200	2300		Palau, KHBN/Voice of Hope	9955as	9965as	9985as
2200	2300		Sierra Leone, Sierra Leone BS	3316do		
2200	2300	vl	Solomon Islands, SIBC	5020do	9545do	
2200	2300	as	Spain, R Exterior Espana	9595af	9680eu	
2200	2300	irreg	Sri Lanka, Sri Lanka BC Corp	4940do		
2200	2300		Taiwan, R Taiwan International	5810eu	9355eu	
2200	2300		UK, BBC World Service	9565as	9575na	6175na 6195va
			7105as	9590na	9660as	11835af 11955as
			12080pa	12095sa	15400af	
2200	2300	fa	UK, Global Kitchen/Merlin	3955eu	6170eu	7165eu
2200	2300		Ukraine, R Ukraine International	5905va	9560va	11770va
2200	2300		USA, Armed Forces Radio	4278va	4319va	4993va 5765va
			6350va	6458va	6847va	10320va 10940va
			12579va	12689va	13362va	16847va
2200	2300		USA, KAIJ Dallas TX	13815va		
2200	2300		USA, KTNB Salt Lake City UT	15590na		
2200	2300		USA, KWHR Naalehu HI	17510as		
2200	2300		USA, Voice of America	7215as	9770as	9890as 11760as
			15185as	15290as	15305pa	17735pa 17820as
2200	2300		USA, WBCQ Monticello ME	7415na		
2200	2300		USA, WEWN Birmingham AL	9975na	13615na	15375na
2200	2300		USA, WHRA Greenbush ME	17650af		
2200	2300		USA, WHRI Noblesville IN	5745na	9495sa	13760na
2200	2300		USA, WINB Red Lion PA	13570eu		
2200	2300		USA, WJCR Upton KY	7490va	13595as	
2200	2300		USA, WRMI Miami FL	15725am		
2200	2300		USA, WSHB Cypress Crk SC	7510eu	15285sa	
2200	2300		USA, WTJC Newport NC	9370na		
2200	2300		USA, WWCR Nashville TN	5070am	9435am	13845am
2200	2300		USA, WWFV McCaysville GA	6890va		
2200	2300	mtwhf	USA, WWFV McCaysville, GA	9320va		
2200	2300	vl	Vanuatu, Radio	3945do	4960do	7260do
2200	2300		Zambia, Christian Voice	4965do		
2230	2257		Czech Rep, Radio Prague Intl	7345na	9435af	
2230	2300		Albania, R Tirana International	7130eu	9540eu	
2230	2300		Australia, Christian Voice	13780va	15165va	17645va 21680va
2230	2300	mtwhf	Austria, R Austria International	5945eu	6155eu	13730af
2230	2300		Belgium, Radio Vlaanderen Intl	13660am		
2230	2300		Cuba, Radio Havana	9550am		
2230	2300		Hungary, Radio Budapest	3975eu		
2230	2300	vl/as	Solomon Islands, SIBC	5020do		
2230	2300	vl/o	Solomon Islands, SIBC	9545do		
2230	2300		Sweden, Radio	6065va	7235va	
2245	2300		India, All India Radio	9705as	9950as	11620as 13605as
2245	2300		USA, WYFR Okeechobee FL	11740na		
2245	2300		Vatican City, Vatican Radio	7305as	9600as	11830as



FREQUENCIES

2300 0000	Anguilla, Caribbean Beacon	6090am			
2300 0000 vl	Australia, ABC/Alice Springs	4835do			
2300 0000 vl	Australia, ABC/Katherine	5025do			
2300 0000 vl	Australia, ABC/Tennant Creek	4910do			
2300 0000	Australia, Christian Voice	13780va	15165va	17645va	21680va
2300 0000	Australia, Radio	9660pa	12080pa	17715va	17795va
	21740va				
2300 0000 vl	Cameroon, RTV/Yaounde	4850do			
2300 0000	Canada, CBC Northern Service	9625do			
2300 0000	Canada, CFRX Toronto ON	6070do			
2300 0000	Canada, CFVP Calgary AB	6030do			
2300 0000	Canada, CHNX Halifax, NS	6130do			
2300 0000	Canada, CKZN St John's NF	6160do			
2300 0000	Canada, CKZU Vancouver BC	6160do			
2300 0000	Costa Rica, R for Peace Intl	15048va	15065va	21815usb	
2300 0000	Costa Rica, University Network	15048va	15065va	21815usb	
2300 0000	Egypt, Radio Cairo	9900am			
2300 0000 f/monthly	Finland, Scandv Weekend Radio	11690va			
	11720va				
2300 0000 vl	Ghana, Ghana BC Corp	3366do	4915do		
2300 0000	India, All India Radio	9705as	9950as	11620as	13605as
2300 0000 vl	Liberia, R Liberia International	5100do			
2300 0000	Malaysia, Radio	7295do			
2300 0000	Malaysia, RTM Kota Kinabalu	5980do			
2300 0000	Namibia, Namibian BC Corp	3270af	3289af		
2300 0000	New Zealand, ZLX	3935do			
2300 0000	Palau, KHBN/Voice of Hope	9965as	9985as		
2300 0000	Sierra Leone, Sierra Leone BS	3316do			
2300 0000 vl/as	Solomon Islands, SIBC	5020do			
2300 0000 vl/a	Solomon Islands, SIBC	9545do			
2300 0000	Sri Lanka, Sri Lanka BC Corp	4940do			
2300 0000	Turkey, Voice of	6020eu	9655na		
2300 0000	UK, BBC World Service	3915as	5965as	5975na	6035as
	6175na	6195va	7105as	9590na	11945as
	11955as	12095sa	15280as		
2300 0000 fa	UK, Global Kitchen/Merlin	3955eu	6170eu	7165eu	
2300 0000	USA, Armed Forces Radio	4278va	4319va	4993va	5765va
	6350va	6458va	6847va	10320va	10940va
	12579va	12689va	13362va	16847va	
2300 0000	USA, KAIJ Dallas TX	13815va			
2300 0000	USA, KTBH Salt Lake City UT	15590na			
2300 0000	USA, KWHR Naalehu HI	17510as			
2300 0000	USA, Voice of America	7215as	9770as	9890as	11760as
	15185as	15290as	15305pa	17735pa	17740pa
2300 0000	USA, WBCQ Monticello ME	7415na			
2300 0000	USA, WEWN Birmingham AL	7425na	9385na	9975na	13615na
2300 0000	USA, WHRA Greenbush ME	17650na			
2300 0000	USA, WHRI Noblesville IN	5745na	9495sa	13760na	
2300 0000	USA, WINB Red Lion PA	13570am			
2300 0000	USA, WJCR Upton KY	7490va	13595as		
2300 0000	USA, WRMI Miami FL	9955am			
2300 0000	USA, WSHB Cypress Crk SC	7510va	15285sa		
2300 0000	USA, WTJC Newport NC	9370na			
2300 0000	USA, WWCR Nashville TN	3215am	5070am	7435am	13845am
2300 0000	USA, WWFV McCaysville GA	5085va	6980va		
2300 0000 vl	Vanuatu, Radio	3945do	4960do	7260do	
2300 0000	Zambia, Christian Voice	4965do			
2300 2305 vl	Nigeria, Radio/Enugu	6025do			
2300 2305 vl	Nigeria, Radio/Ibadan	6050do			
2300 2305 vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
2300 2305 vl	Nigeria, Radio/Lagos	3326do	4990do		
2300 2315 vl	Italy, IRRS	3985va			
2300 2315	Vatican City, Vatican Radio	7305as	9600as	11830as	
2300 2329	Canada, R Canada International	5960am	9755am	11865am	
2300 2329 mtwhf	Canada, R Canada International	6040am	11865am	13730am	
2300 2330	Cuba, Radio Havana	9550am			
2300 2330 mtwhf	Mexico, R Mexico International	9705am	11770am		
2300 2330	Mongolia, Voice of	12015as	12085as		
2300 2330	USA, VOA Special English	6045as	7140as	9545as	11925as
	15395as				
2300 2345	Germany, Deutsche Welle	9470as	9815as	13690as	17655as
2300 2345	USA, WYFR Okeechobee FL	11740na			
2300 2356	China, China Radio International	5990na			
2300 2359	New Zealand, R New Zealand Int	17675pa			
2300 2359	Romania, R Romania International	7195eu	9570na	9690eu	9690eu
	11940na				
2330 0000	Canada, R Canada International	5960am	9755am		
2330 0000	Malaysia, RTM Sarawak	7160do			
2330 0000	Netherlands, Radio	6165na	9845na		
2330 0000	Switzerland, Swiss R International	9885sa	11660sa		
2330 0000	USA, VOA Special English	6045as	7130as	7130as	7140as
	9545as	11805as	11925as	13745as	
	15205as	15395as			
2330 2345 vl	Libya, Voice of Africa	11815af	17725af		
2330 2357	Czech Rep, Radio Prague Intl	7345na	9435na		
2330 2357	Vietnam, Voice of	9839as	12019as		

SELECTED PROGRAMS

Daily

2300	BBCWS(am)	The World Today (the BBC's agenda-setting flagship global news program)
	China R. Int.	News
	R. Australia	RA News
2330	R. Prague	News

Sunday

2300	R. Canada Int.	The World This Weekend (Lorna Jackson presents a weekend news roundup and magazine)
	R. New Zealand Int.	Midday Report (news updates and in-depth reports)*
2310	R. Australia	Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)
	China R. Int.	In the Spotlight (Chinese arts and cultural magazine)
2320	BBCWS(am)	The Greenfield Collection (Edward Greenfield plays classical music requests and selections from his own collection)
2330	R. Australia	Earthbeat (Alexandra DeBlas presents a program on environmental science)
	R. Canada Int.	The Inside Track (Robin Brown presents interviews and documentaries on the issues of sport)
	R. Netherlands	News
	R. New Zealand Int.	Spectrum (a weekly look at the people, places and events around NZ)
2335	R. Netherlands	Sincerely Yours (Veronica Wilson hosts RN's listener response program)

Monday

2300	R. New Zealand Int.	Midday Report (news updates and in-depth reports)*
2310	R. Australia	Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)
	China R. Int.	People in the Know (interviews with prominent Chinese who are shaping the nation's future)
	R. Australia	Innovations (a program showcasing Australian invention, enterprise and ingenuity)

Monday-Friday

2300	R. Canada Int.	The World at Six (CBC Radio's major evening news program with Russ Germain and Barbara Smith)
2330	R. Canada Int.	As It Happens (Barbara Budd and Mary Lou Finley interview newsmakers from the famous to ordinary people eyewitnessing news in the making)
	R. Netherlands	Newsline (news, analysis and background reports)

Tuesday

2300	R. New Zealand Int.	Midday Report (news updates and in-depth reports)*
2310	R. Australia	Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)

2330	China R. Int.	Sports World (the sports scene in China and Asia)
	R. Australia	Arts Talk (Julie Copeland/the world of arts and cultural ideas)

Wednesday

2300	R. New Zealand Int.	Midday Report (news updates and in-depth reports)*
2310	R. Australia	Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)
	R. Australia	Rural Reporter (ABC's rural reporters present news and stories from rural and regional Australia)

Thursday

2300	R. New Zealand Int.	Midday Report (news updates and in-depth reports)*
2310	R. Australia	Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)
	R. Australia	The Media Report (Mick O'Regan takes a critical look at the latest developments in the communications industry)

Friday

2300	R. New Zealand Int.	RN News*
2310	R. New Zealand Int.	Focus on Politics (a report on government and politics in NZ)*
2315	R. Australia	Lingua Franca (Jill Kitson presents a program about language and its social, cultural and historical ramifications)
	BBCWS(am)	Global Business (Peter Day charts the transformations sweeping through the world of work and commerce)
	China R. Int.	Life in China (a weekly magazine focusing on the lives of ordinary people in China)

R. Australia	In Conversation (Robin Williams talks not only to scientists, but also to those interested in the subject, about what it's meant to their lives)
R. New Zealand Int.	The Sampler (Nick Bollinger casts a critical ear over the latest CD offerings)*

Saturday

2300	R. Canada Int.	The World This Weekend (Lorna Jackson presents a weekend news roundup and magazine)
	R. New Zealand Int.	RN News*
2305	R. Australia	Ockham's Razor (sharp commentaries on scientific issues)
2310	R. New Zealand Int.	The Week in Parliament (NZ political news)*
2330	BBCWS(am)	Arts in Action (a weekly report on trends and developments in the fine arts around the world)
	R. Canada Int.	Madly Off in All Directions (Host Lorne Elliott showcases a mix of comedy, as well as music, improvisation and satirical stand-up from all across Canada)
	R. Netherlands	News
	WHRI(9495 kHz.)	Dxing with Cumbre (Marie Lamb with the hottest DX catches)
2335	R. Netherlands	Europe Unzipped (the events of the past week in Europe, some unusual)
	R. Prague	Readings from Czech Literature
2340	R. Prague	Saturday Music (Czech classical, folk, jazz or rock)
		(*This RNZ program airs one hour UT later from March 18.)

Thank You ...

Additional Contributors to This Month's Shortwave Guide:

John Babbis, Silver Spring, MD; Tom Banks, Dallas, TX; Bob Fraser, Cohasset, MA; Glenn Hauser, Enid, OK/*World of Radio*; Hans Johnson, WY/Ulis Fleming, MD/*Cumbre DX/DXing With Cumbre*; BBCM; Robert E. Thomas, Bridgeport, CT; *BBC On-Air*; Harold Sellers, *DX Ontario*; *Hard Core DX*; Radio Sweden/*Media Scan*; Usenet Newsgroups; *World-wide DX Club*.

Satellite Service Guide



All Frequencies MHz

Robert Smathers
roberts@nmia.com

GE Americom GE-6

C-Band - 72 degrees W. Long.

1(V)	3720	Occasional video
2(H)	3740	Occasional video
3(V)	3760	Occasional video
4(H)	3780	Occasional video
5(V)	3800	Occasional video
6(H)	3820	Occasional video
7(V)	3840	Occasional video
8(H)	3860	Occasional video
9(V)	3880	Occasional video
10(H)	3900	Occasional video
11(V)	3920	Occasional video
12(H)	3940	Occasional video
13(V)	3960	Occasional video
14(H)	3980	Occasional video
15(V)	4000	Occasional video
16(H)	4020	Occasional video
17(V)	4040	Occasional video
18(H)	4060	Occasional video
19(V)	4080	Occasional video
20(H)	4100	Occasional video
21(V)	4120	Occasional video
22(H)	4140	Occasional video
23(V)	4160	Occasional video
24(H)	4180	Occasional video

GE Americom GE-6

Ku-Band - 72 degrees W. Long.

1(V)	11720	Occasional video
2(H)	11740	Occasional video
3(V)	11760	Occasional video
4(H)	11780	Occasional video
5(V)	11800	Occasional video
6(H)	11820	Occasional video
7(V)	11840	Occasional video
8(H)	11860	Occasional video
9(V)	11880	Occasional video
10(H)	11900	Occasional video
11(V)	11920	Occasional video
12(H)	11940	Occasional video
13(V)	11960	Occasional video
14(H)	11980	Occasional video
15(V)	12000	Occasional video
16(H)	12020	Occasional video
17(V)	12040	Occasional video
18(H)	12060	Occasional video
19(V)	12080	Occasional video
20(H)	12100	Occasional video
21(V)	12120	Occasional video
22(H)	12140	Occasional video
23(V)	12160	Occasional video
24(H)	12180	Occasional video
25(V)	11535	Occasional video
26(H)	11535	Occasional video
27(V)	11655	Occasional video
28(H)	11655	Occasional video

Panamsat Galaxy 6

C-band - 74 degrees West longitude

1(H)	3720	Occasional video
2(V)	3740	CMT Asia Digital
3(H)	3760	Occasional video
4(V)	3780	Occasional video
5(H)	3800	Occasional video
6(V)	3820	Occasional video
7(H)	3840	Occasional video
8(V)	3860	Occasional video
9(H)	3880	Occasional video
10(V)	3900	Occasional video
11(H)	3920	Occasional video
12(V)	3940	Occasional video
13(H)	3960	Occasional video
14(V)	3980	Occasional video
15(H)	4000	Occasional video
16(V)	4020	Occasional video
17(H)	4040	Occasional video
18(V)	4060	Occasional video
19(H)	4080	Occasional video
20(V)	4100	Occasional video
21(H)	4120	Occasional video
22(V)	4140	Occasional video
23(H)	4160	Occasional video
24(V)	4180	Occasional video

Panamsat SBS-6

Ku-Band - 74 degrees W. Long.

T01(H)	11725.0	Data Transmissions
T02(V)	11749.5	CONUS Communications Digital
T03(H)	11774.0	Occasional video
T04(V)	11798.5	Occasional video
T05(H)	11823.0	CONUS Communications ITC
T06(V)	11847.5	CONUS Communications ITC

T07(H)	11872.0	Occasional video
T08(V)	11896.5	Occasional video
T09(H)	11921.0	Occasional video
T10(V)	11945.5	Occasional video
T11(H)	11970.0	Occasional video
T12(V)	11994.5	Data Transmissions
T13(H)	12019.0	Occasional video
T14(V)	12043.5	Data Transmissions
T15(H)	12068.0	Occasional video
T16(V)	12092.5	Occasional video
T17(H)	12110.0	Occasional video
T18(V)	12141.5	Occasional video
T19(H)	12166.0	Occasional video

Panamsat SBS-4

Ku-Band - 77 degrees W. Long.

T01(H)	11725	Occasional video
T02(H)	11780	Occasional video
T03(H)	11823	Occasional video
T04(H)	11872	Occasional video
T05(H)	11921	Occasional video
T06(H)	11970	Occasional video
T07(H)	12019	Occasional video
T08(H)	12068	Occasional video
T09(H)	12117	Occasional video
T10(H)	12166	Occasional video

GE Americom GE-5

Ku-Band - 79 degrees W. Long.

1(V)	11730.0	Data Transmissions/Utah State Educ. - Digital
2(H)	11743.0	Data Transmissions
3(V)	11791.0	Data Transmissions
4(H)	11804.0	Empire Sports Network Digital

5(V)	11852.0	CBS feeds - Digital
6(H)	11865.0	Data Transmissions
7(V)	11913.0	Data Transmissions
8(H)	11926.0	GE-5 ID Slate/Data Transmissions
9(V)	11974.0	ABC feeds - ITC and Digital
10(H)	11987.0	Occasional video
11(V)	12035.0	CNN feeds - ITC and Digital
12(H)	12048.0	Occasional video
13(V)	12096.0	Occasional video
14(H)	12109.0	Occasional video
15(V)	12157.0	Occasional video/Data Transmissions
16(H)	12170.0	NY Net (Digital)/Data Transmissions

GE Americom Satcom K2

Ku-Band - 81 degrees W. Long.

T01(H)	11729.0	NBC feeds
T02(V)	11773.0	NBC feeds
T03(H)	11788.0	NBC feeds
T04(V)	11821.0	NBC feeds
T05(H)	11847.0	NBC feeds
T06(V)	11874.0	Data Transmissions
T07(H)	11921.0	NBC feeds
T08(V)	11942.0	NBC feeds
T09(H)	11970.0	NBC feeds
T10(V)	11994.5	NBC feeds
T11(H)	12019.0	NBC HDTV
T12(V)	12067.0	NBC feeds
T13(H)	12083.0	NBC feeds
T14(V)	12117.0	NBC feeds
T15(H)	12142.0	NBC feeds
T16(V)	12166.0	NBC NewsChannel



NEW RECEIVER

UNIVERSAL SC-50

SUBCARRIER-FM² AUDIO RECEIVER

RECEIVE ALL FM² AND AUDIO SUBCARRIERS—100 kHz to 9 MHz

Full featured audio services, music, all sports, talk shows, news, religious programming, major radio stations, variety, public radio plus many other services, no fees. The SC-50 audio subcarrier receiver will work with all home satellite systems, 3-minute hookup, simple and quick to tune, 16-character display, 50-channel memory bank, direct frequency readout, covers all FM² and audio subcarrier channels, hundreds of free programming channels.

FOR INTRODUCTORY PRICE CALL: 1 - 828 - 293-2222

UNIVERSAL ELECTRONICS, INC. 4515 LITTLE SAVANNAH RD., CULLOWHEE, NC 28723
Communications Specialists (828) 293-2222 FAX (828) 293-2221

Eclipse Weather!

Although I originally set up my first weather satellite (WXSAT) system as the hardware for a new hobby, it was not long before I realized how useful the resulting pictures were. This was back in the mid-1980s, and the hardware required for receiving and decoding was available from a small number of suppliers. Groups of amateurs were forming clubs, and information about setting up receiving systems was slowly getting published. I joined one such organization – the Remote Imaging Group (RIG) – and discovered that many of its members were actively involved in other satellite groups, such as AMSAT.

One thing that membership quickly taught me is that with any hobby likely to involve buying new equipment, talking with like-minded hobbyists is a valuable source of advice for minimal cost. Check out your local groups by contacting the national organizations, where you may find that there is a local club just waiting to help.

<http://www.rig.org.uk/>

<http://www.amsat.org/>

If the weather forecasters were tuned to our specific needs, their broadcasts might be significantly different! I routinely monitor WXSAT images with the hope that an occasional clear night sky might provide an opportunity to spend some hours at the telescope. This was the case for the January 9, 2001, total eclipse of the Moon. We had previously had two clear nights, but during the hours before the eclipse a huge rain-bearing weather system arrived off southwest Britain, ready to provide complete cloud cover for the first lunar eclipse of the 21st century. The national forecasts showed that the whole of southern Britain would be under thick cloud cover, and my WXSAT monitoring system confirmed this probability.

Leaving the WEFAX system animating infrared images of the region, the slow drift of the weather system could be seen by the most untrained of eyes. For those perhaps unfamiliar with the term WEFAX, it refers to the *weather facsimile* transmissions made by many of the geostationary WXSATs. These transmissions are usually on 1691.0 MHz and can be received by setting up a reception system pointed at GOES-8 and/or GOES-10, depending on your location. In Europe, we point our WEFAX dishes/Yagis at Meteosat-7.

The beauty of WEFAX is twofold: the hardware necessary for reception is inexpensive – requiring a Yagi or small dish, a receiver, and suitable decoding software – and secondly, the images are nearly continuous, with cycles of transmissions enabling ongoing animations.

During the afternoon of January 9, NOAA-

16 provided a high resolution image of western Europe. Because of an apparently faulty switch, NOAA-16's APT transmission – normally on 137.62 MHz – had not been re-enabled, as of early January. This coincided with a partial footprint overlap with NOAA-14 for a few weeks, so NOAA-16's APT would have been switched off anyway. (Hopefully, by the time this edition of MT is published, NOAA-16 will be an operational satellite, having completed all the scheduled tests.) The HRPT scanner and transmission system onboard NOAA-16 appear to be in perfect order, and I received consistent, good quality imagery. The visible-light image showed some thin sections of cloud that gave cause for some minor optimism that all might not be lost with the eclipse.

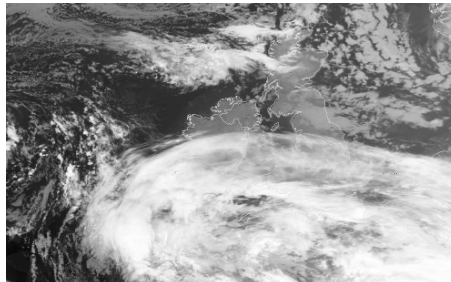


Fig 1: NOAA-12 1710 UTC January 9, 2001, HRPT infrared image (See "Letters" for the eclipse itself.)

The pass from NOAA-12 – see figure 1 – showed that some very dense cloud was around, but also revealed small areas of thinner cloud – and it was these that were to provide numerous tantalizing glimpses of the eclipse during the evening. I was able to observe and image the eclipsed Moon for short periods until after totality – proving the usefulness of the WXSAT monitoring.

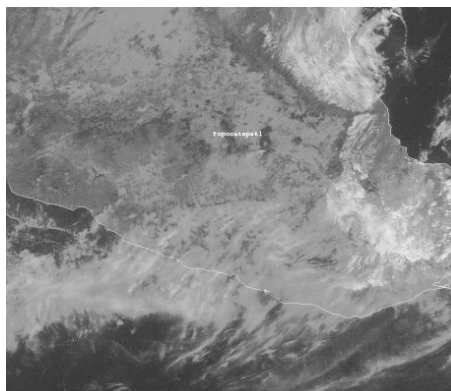


Fig 2: Meteor 3-5 1646 UTC December 27, 2001 – unfortunately in black and white!

Tom Gwilym has been experimenting with the addition of color to Resurs and Meteor images, such as a subtle green for land areas. Tom uses an automatic recording system to record APT signals and process them later – correlating pass times with the logged recordings. Figure 2 shows Tom's processing of the north-bound Meteor 3-5 pass over California just after Christmas. Meteor 2-21 recently replaced Meteor 3-5 for a few weeks.

Joseph Gresham recorded this GOES-8 continental USA image showing the volcanic activity from Popocatepetl near Mexico City, showing the ash cloud blowing to the west.

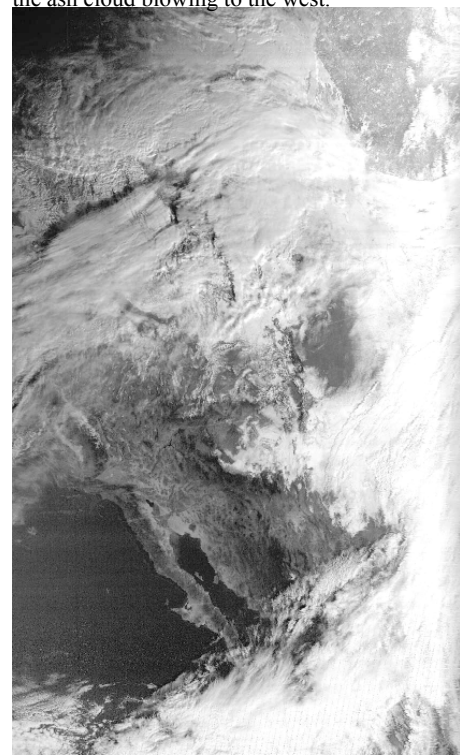


Fig 3: GOES-8 December 15, 2000 showing volcanic activity in Mexico.

Frequencies

NOAA-12 transmits APT on 137.50 MHz
 NOAA-14 transmits APT on 137.62 MHz
 NOAA-15 and NOAA-16 APT may remain off
 NOAA's transmit beacon data on 137.77 or 136.77 MHz
 Meteor 3-5 may transmit APT on 137.30 MHz when in sunlight
 Resurs 1-4 transmits APT on 137.85 MHz
 GOES-8 and GOES-10 use 1691 MHz for WEFAX

See ad for Swagur on page 89 for satellite weather equipment.

Monitoring the Department of Housing and Urban Development

This department in the United States government is responsible for the nation's housing needs and been a high profile agency since its birth. Created as part of President Lyndon B. Johnson's War on Poverty, the Department of Housing and Urban Development (HUD) was established by Congress in November 1965 as a Cabinet Department which consolidated a number of other older federal agencies.

The Department of Housing and Urban Development is the Federal agency responsible for national policy and programs that address America's housing needs, improve and develop the nation's communities, and enforce fair housing laws. HUD's business is helping create a decent home and suitable living environment for all Americans, and it has given America's cities a strong national voice at the Cabinet level.

However, HUD has a very low profile communications support structure. Not much has been known about its communications activities until now. In the United States very few locations have dedicated communications systems in place for day-to-day department communications. Here is what is known.

165.6625/169.100	Hartford, CT
165.6625/169.100	Boston, MA
165.6625/169.100	Nationwide allocation. Used to provide physical security to the HUD Secretary while on travel status.
168.0000 Simplex	Washington, D.C. KGU 70 Motor Pool (may no longer be in use)
408.400 Simplex	Atlanta, GA
408.400 Simplex	New York City, NY
409.500 Simplex	Chicago, IL
417.950 Simplex	Washington, D.C., Maintenance Staff
418.075 Simplex	San Francisco, CA
418.075 Simplex	Washington, D.C., Computer Support Staff

◆ DOE Los Alamos Update

In the November 2000 edition of this column we presented information on several DOE trunked systems in the western United States. An anonymous contributor recently forwarded an update on this system.

Los Alamos National Lab, New Mexico

System: Ericsson EDACS

Frequencies: 406.350 (LCN1) 407.150 (LCN3) 407.350 (LCN6) 407.550 (LCN7) 407.950 (LCN2) 408.550 (LCN8) 408.750 (LCN4) 408.950 (LCN9) 409.550 (LCN5) 410.150 (LCN10)

Talkgroups:

02-015	Traffic Control (Roads and Grounds)
02-031	Misc Lab Divisions No specific IDs
02-041	Fire Dispatch/Enroute
02-042	Fire Department Tactical Channel 2

02-043	Fire Department Tactical Channel 3
02-044	Fire Department Tactical Channel 4
02-045	Fire Department Tactical Channel 5
02-046	Fire Department Tactical Channel 6
02-052	Pest Control (Roads and Grounds)
02-053	Misc Lab Divisions No specific IDs
02-095	Misc Lab Divisions No specific IDs
02-112	Fire Protection Alarm Repair and Maintenance
02-141	Fire Department Ambulances to Hospital Emergency Room
02-143	Misc Lab Divisions No specific IDs
02-152	Operations Center (Tech Area 53)
03-003	Misc Lab Divisions No specific IDs
03-006	Misc Lab Divisions No specific IDs
03-022	Emergency Management vehicles (Hazmat)
03-051	Utilities
03-052	Utilities
03-071	Lab Security Dispatch (Pro Force)
03-073	Lab Security Special Ops (Pro Force)
03-081	Utilities
03-094	Misc Lab Divisions No specific IDs
03-100	Scheduling ??
03-101	Security Gate (Sigma Site)
03-111	Emergency Management Dispatch
04-005	Lab Taxi Service
13-125	Access Control/High Explosive Testing Facilities

Many thanks to our western contributor for this update on Los Alamos. If you are monitoring a government trunk system, we want to hear from you. Contact us via email at the address above or at our snail mail address: The Fed Files, P.O. Box 98, Brasstown, NC 28902

◆ The FBI in West Virginia

Recently a source forwarded to us a profile on the FBI in West Virginia. Here is the background material on that state's communications system.

West Virginia FBI Offices:

(All counties in West Virginia covered by the Pittsburgh FBI Field Office)

Beckley Resident Agency	KEX 673
Charleston Resident Agency	KEX 670
Clarksburg Resident Agency	Unknown
Huntington Resident Agency	KEX 671
Martinsburg Resident Agency	Unknown
Parkersburg Resident Agency	KEX 668 (Note: This office might be closed-LVH)
Wheeling Resident Agency	KEX 663

FBI PL Tone: 6Z (167.9 Hz) Used systemwide

Repeater output/Repeater input

165.9750/163.7500	Wheeling RA — Empire, Hancock
167.2625/163.7250	Clarksburg RA — Chestnut Ridge, Elkins
167.2875/163.7000	Beckley RA — Craigsville, Point Mtn, Rosedale, Sugarloaf, Wallback
167.3375/162.6125	Beckley RA — Bald Knob (possible talk around also)

167.3625/163.8375	Beckley RA — Bee Mtn, Kingston, Kopperston, Malden Mtn (possible talk around also)
167.3875/163.7000	Beckley RA — Canaan, Kingston, Point Mtn, Rosedale
167.4125/163.7000	Beckley RA — Newton, Wallback (possible talk around also)
167.4875/163.9625	Parkersburg RA — Buzzard, Hargreave, Kenna, Ravenswood, Spencer
167.5125/163.9125	Huntington RA — Barker Ridge, Centerville, German Ridge
167.5375/163.8625	Transportable Repeater
167.5375 Simplex	Beckley RA, Charleston RA, Huntington RA, Martinsburg RA, Parkersburg RA, Wheeling RA. The frequency 167.5375 is a nationwide common and extended car-to-car
167.5625 Simplex	Beckley RA, Charleston RA, Clarksburg RA, Huntington RA, Martinsburg RA, Parkersburg RA, Wheeling RA
167.5875/163.7250	Clarksburg RA — Chestnut Ridge, Davis Mtn, Elkins, Fort Hill
167.5875/163.9125	Huntington RA — Mann Knob, Rotary Park
167.6375 Simplex	Beckley RA, Charleston RA, Martinsburg RA, Parkersburg RA, Wheeling RA (possible talk around or dispatch)
167.6875/162.6125	Beckley RA — Bald Knob, Big Swell, Kopperston
167.7125/163.9625	Parkersburg RA — Buzzard, Hargreave, Kenna, Ravenswood, Spencer
167.7375/163.9125	Huntington RA — Huntington
167.7375/163.9625	Parkersburg RA — Hargreave, Kenna
167.7625/163.8375	Beckley RA — Bee Mtn, Malden Mtn
167.7875/163.8375	Beckley RA — Bee Mtn, Kopperston
167.7875/163.9125	Huntington RA — Mann Knob
168.350 Simplex	Clarksburg RA — Security Force
168.9000/163.8875	Wheeling RA — Mountsville
168.9500/163.7250	Clarksburg RA — Chestnut Ridge, Davis Mtn, Elkins, Fort Hill, Sand Springs
169.6250/163.9125	Clarksburg RA — Chestnut Ridge
169.7250/163.9125	Clarksburg RA — Chestnut Ridge
170.6250/163.7000	Beckley RA — Craigsville, Rosedale
170.7000/163.9125	Clarksburg RA — Chestnut Ridge
170.7750/163.8875	Wheeling RA — West Liberty
170.8250/163.7000	Martinsburg RA — Martins Hill
170.8250/163.9625	Parkersburg RA — Buzzard, Hargreave, Kenna, Ravenswood, Spencer
170.9000/163.7250	Clarksburg RA — Chestnut Ridge
170.9000/163.8375	Huntington RA — Barker Ridge
170.9000/163.9125	Huntington RA — Barker Ridge, Centerville, German Ridge, Rotary Peak
170.9000 Simplex	West Virginia Statewide
170.9500 Simplex	West Virginia Statewide
171.6250/166.2000	Clarksburg RA
412.4000	Charleston RA fixed repeater to Bald Knob (which links the Beckley repeaters)
453.7000/458.7000	Clarksburg RA to Clarksburg PD link

And that is it for this month's edition of The Fed Files. Now it is time to look at this month's federal spectrum scan in Table One. In this issue we continue our detailed look at the reorganized 406-420 MHz UHF federal land mobile service. 73 and good hunting.

Table One: Federal UHF Land Mobile Service

Frequency	Ch/Paird Freq*	Agencies
410.0000	312/419.0000	Air Force, Army, Energy Department, FAA, GSA, NASA, Navy, Post Office, US Information Agency, Veterans Administration
410.0125	313/419.0125	(No reported activity)
410.0250	314/419.0250	Air Force, Army, Coast Guard, Energy Department, FAA, GSA, Health Resources and Services Administration (HHS), Labor Department (Nationwide), Navy, Post Office, US Information Agency, Veterans Administration
410.0375	315/419.0375	(No reported activity)
410.0500	316/419.0500	Census Bureau, Commerce Department, Energy Department, National Ocean Service, National Weather Service
410.0625	317/419.0625	(No reported activity)
410.0750	318/419.0750	National Weather Service-Interrogated ASOS weather data collection platforms (Nationwide), Navy
410.0875	319/419.0875	(No reported activity)
410.1000	320/419.1000	National Weather Service-NOAA weather radio link (Nationwide)
410.1125	321/419.1125	(No reported activity)
410.1250	322/419.1250	Energy Department, Environmental Research Lab
410.1375	323/419.1375	NASA
410.1500	324/419.1500	Federal Trunk Group 4 (paired with 418.1500): Air Force, Army, Energy Department, Environmental Research Lab, National Bureau of Standards, Navy
410.1625	325/419.1625	(No reported activity)
410.1750	326/419.1750	Army, Census Bureau, NASA, NOAA (Nationwide)
410.1875	327/419.1875	Interagency Law Enforcement UHF Interoperability Channel <Inop 2> (Paired with 419.1875-167.9 Hz PL-NAC S68F) and UHF Interoperability Channel <Inop 8> (Simplex -167.9 Hz PL-NAC S68F)
410.2000	328/419.2000	Air Force, Army, Energy Department, FAA, Forest Service, Government Printing Office, Health Resources and Services Administration (HHS), Indian Health Service (HHS), NASA, Navy, Post Office (Nationwide), US Information Agency, Veterans Administration
410.2125	329/419.2125	(No reported activity)
410.2250	330/419.2250	Army, Environmental Research Lab, National Ocean Service, Social Security Administration
410.2375	331/419.2375	Interagency Law Enforcement UHF Joint Incident Response Calling Channel (Paired with 419.2375-No CTCSS-NAC S68F) and UHF Joint Incident Response Channel <UHF-6> (Simplex-CTCSS As Required-NAC S68F)
410.2500	332/419.2500	Air Force, FAA-Various Digital Systems (Nationwide), Navy
410.2625	333/419.2625	(No reported activity)
410.2750	334/419.2750	Forest Service (Nationwide), NASA
410.2875	335/419.2875	(No reported activity)
410.3000	336/419.3000	FAA-Various Digital Systems (Nationwide), NASA
410.3125	337/419.3125	(No reported activity)
410.3250	338/419.3250	Navy, Post Office (Nationwide), Veterans Administration
410.3375	339/419.3375	(No reported activity)
410.3500	340/419.3500	Energy Department (Nationwide), Post Office
410.3625	341/419.3625	(No reported activity)
410.3750	342/419.3750	Air Force, Coast Guard (Nationwide), Energy Department, Navy, Veterans Administration
410.3875	343/419.3875	(No reported activity)
410.4000	344/419.4000	Air Force, Army, Center for Disease Control, FAA, Forest Service, National Bureau of Standards
410.4125	345/419.4125	(No reported activity)
410.4250	346/419.4250	Environmental Research Lab (Nationwide)
410.4375	347/419.4375	Interagency Law Enforcement UHF Joint Incident Response Channel <UHF-1> (Paired with 419.4375-CTCSS As Required-NAC S68F) and UHF Joint Incident Response Channel <UHF-7> (Simplex-CTCSS As Required-NAC S68F)
410.4500	348/419.4500	Army, National Ocean Service (Nationwide), National Science Foundation (Nationwide)
410.4625	349/419.4625	(No reported activity)
410.4750	350/419.4750	National Bureau of Standards, NOAA (Nationwide), NOAA Air Operations Center
410.4875	351/419.4875	(No reported activity)
410.5000	352/419.5000	Census Bureau, Environmental Research Lab (Nationwide), National Ocean Service (Nationwide)
410.5125	353/419.5125	(No reported activity)
410.5250	354/419.5250	Army, Environmental Research Lab, National Ocean Service, Patent and Trademark Office
410.5375	355/419.5375	(No reported activity)
410.5500	356/419.5500	Census Bureau, NOAA (Nationwide)
410.5625	357/419.5625	(No reported activity)
410.5750	358/419.5750	National Weather Service-NOAA weather radio link (Nationwide)
410.5875	359/419.5875	(No reported activity)
410.6000	360/419.6000	Bureau of Reclamation, FAA, Interior Department (Nationwide)
410.6125	361/419.6125	Interagency Law Enforcement UHF Interoperability Channel <Inop 3> (Paired with 419.6125-167.9 Hz PL-NAC S68F) and UHF Interoperability Channel <Inop 9> (Simplex -167.9 Hz PL-NAC S68F)
410.6250	362/419.6250	Bureau of Mines (Nationwide), Fish and Wildlife Service (Nationwide), Interior Department (Nationwide), National Park Service (Nationwide)
410.6375	363/419.6375	Interagency Law Enforcement UHF Joint Incident Response Channel <UHF-2> (Paired with 419.6375-CTCSS As Required-NAC S68F) and UHF Joint Incident Response Channel <UHF-8> (Simplex-CTCSS As Required-NAC S68F)
410.6500	364/419.6500	FAA, National Bureau of Standards, Navy
410.6625	365/419.6625	(No reported activity)
410.6750	366/419.6750	National Bureau of Standards (Nationwide), NOAA (Nationwide)
410.6875	367/419.6875	(No reported activity)
410.7000	368/419.7000	Environmental Research Lab (Nationwide), Government Printing Office, NOAA
410.7125	369/419.7125	(No reported activity)
410.7250	370/419.7250	NOAA
410.7375	371/419.7375	(No reported activity)
410.7500	372/419.7500	Army, Federal Reserve System, National Bureau of Standards, National Ocean Service
410.7625	373/419.7625	(No reported activity)
410.7750	374/419.7750	Agriculture Stabilization and Conservation Service, Bureau of Land Management (Nationwide), Forest Service (Nationwide)
410.7875	375/419.7875	(No reported activity)
410.8000	376/419.8000	Energy Department (Nationwide)
410.8125	377/419.8125	Energy Department
410.8250	378/419.8250	National Bureau of Standards, National Ocean Service, NOAA
410.8375	379/419.8375	Interagency Law Enforcement UHF Joint Incident Response Channel <UHF-3> (Paired with 419.8375-CTCSS As Required-NAC S68F) and UHF Joint Incident Response Channel <UHF-9> (Simplex-CTCSS As Required-NAC S68F)
410.8500	380/419.8500	NOAA
410.8625	381/419.8625	NASA
410.8750	382/419.8750	NOAA
410.8875	383/419.8875	(No reported activity)
410.9000	384/419.9000	Environmental Research Lab, FAA, Navy
410.9125	385/419.9125	(No reported activity)
410.9250	386/419.9250	Commerce Department (Nationwide)
410.9375	387/419.9375	(No reported activity)
410.9500	388/419.9500	National Weather Service-Interrogated ASOS weather data collection platforms (Nationwide), Navy
410.9625	389/419.9625	(No reported activity)
410.9750	390/419.9750	Census Bureau, National Ocean Service
410.9875	391/419.9875	(No reported activity)
411.0000	392/Simplex	Marshals Service (Nationwide)
411.0125	393/Simplex	(No reported activity)
411.0250	394/Simplex	Energy Department (Nationwide), Justice Department (Nationwide), Navy
411.0375	395/Simplex	(No reported activity)
411.0500	396/Simplex	Marshals Service (Nationwide)
411.0625	397/Simplex	(No reported activity)
411.0750	398/Simplex	Bureau of Prisons, Energy Department (Nationwide), Immigration and Naturalization Service (Nationwide)
411.0875	399/Simplex	(No reported activity)
411.1000	400/Simplex	Marshals Service (Nationwide)
411.1125	401/Simplex	(No reported activity)
411.1250	402/Simplex	Drug Enforcement Agency (Nationwide), FBI (Nationwide)
411.1375	403/Simplex	(No reported activity)
411.1500	404/Simplex	Energy Department (Nationwide), FBI (Nationwide), FEMA, Marshals Service, State Department
411.1625	405/Simplex	(No reported activity)
411.1750	406/Simplex	Bureau of Prisons, Drug Enforcement Agency, FBI, Immigration and Naturalization Service (Nationwide), Marshals Service
411.1875	407/Simplex	(No reported activity)
411.2000	408/Simplex	Energy Department (Nationwide)
411.2125	409/Simplex	(No reported activity)
411.2250	410/Simplex	Agriculture Department (Nationwide), Agricultural Research Service, Animal and Plant Health Inspection Service, Forest Service, NASA, Soil Conservation Service
411.2375	411/Simplex	(No reported activity)
411.2500	412/Simplex	Agriculture Department (Nationwide), Agricultural Research Service, Animal and Plant Health Inspection Service, Federal Reserve System, Forest Service, Navy, Veterans Administration
411.2625	413/Simplex	(No reported activity)
411.2750	414/Simplex	Agriculture Department (Nationwide), Animal and Plant Health Inspection Service, Forest Service, Post Office, Soil Conservation Service
411.2875	415/Simplex	(No reported activity)
411.3000	416/Simplex	Agriculture Department (Nationwide), Animal and Plant Health Inspection Service, Federal Grain and Inspection Service (Nationwide), Forest Service
411.3125	417/Simplex	Forest Service
411.3250	418/Simplex	Agriculture Department (Nationwide), Agriculture Research Service, Animal and Plant Health Inspection Service, Forest Service, Navy, Soil Conservation Service
411.3375	419/Simplex	(No reported activity)
411.3500	420/Simplex	Agriculture Department (Nationwide), Agriculture Research Service, Air Force, FBI, Federal Grain Inspection Service, Forest Service, Labor Department, NASA, Navy, Post Office, TVA
411.3625	421/Simplex	(No reported activity)
411.3750	422/Simplex	Agriculture Department (Nationwide), FEMA, Forest Service
411.3875	423/Simplex	(No reported activity)
411.4000	424/Simplex	Agriculture Department (Nationwide), Air Force, Bureau of Land Management (Nationwide), Forest Service, Library of Congress, Navy, Post Office, Veterans Administration
411.4125	425/Simplex	(No reported activity)
411.4250	426/Simplex	Agriculture Department (Nationwide), Forest Service, Soil Conservation Service, State Department, Veterans Administration
411.4375	427/Simplex	(No reported activity)
411.4500	428/Simplex	Agriculture Department (Nationwide), Air Force, Army, Centers for Disease Control, FAA, Forest Service, NASA, National Institute of Health, Navy, Post Office, TVA
411.4625	429/Simplex	(No reported activity)
411.4750	430/Simplex	Agriculture Department (Nationwide), FEMA, Forest Service
411.4875	431/Simplex	Forest Service
411.5000	432/Simplex	Agriculture Department (Nationwide), Air Force, Army, Forest Service, Labor Department (Nationwide), Navy, Post Office
411.5125	433/Simplex	(No reported activity)
411.5250	434/Simplex	Agriculture Department (Nationwide), Animal and Plant Health Inspection Service, Bureau of Land Management, Forest Service, IRS, TVA
411.5375	435/Simplex	(No reported activity)
411.5500	436/Simplex	Agriculture Department (Nationwide), Air Force, FAA, Forest Service, IRS, NASA, National Gallery of Art, Navy, Post Office, Soil Conservation Service, TVA
411.5625	437/Simplex	(No reported activity)
411.5750	438/Simplex	Agriculture Department (Nationwide), Army, Energy Department, Forest Service, Post Office, TVA
411.5875	439/Simplex	(No reported activity)
411.6000	440/Simplex	Energy Department (Nationwide), Navy
411.6125	441/Simplex	(No reported activity)
411.6250	442/Simplex	Bureau of Indian Affairs, Bureau of Land Management, Bureau of Reclamation, Fish and Wildlife Service, Interior Department (Nationwide), National Park Service, Navy, Post Office, TVA
411.6375	443/Simplex	Energy Department
411.6500	444/Simplex	Bureau of Indian Affairs, Bureau of Reclamation, Energy Department, Geologic Survey, Interior Department (Nationwide), International Boundary and Water Commission, National Park Service, Navy, Post Office, TVA
411.6625	445/Simplex	Energy Department
411.6750	446/Simplex	Bureau of Indian Affairs, Bureau of Land Management, Energy Department, Fish and Wildlife Service, Interior Department (Nationwide), National Park Service, TVA
411.6875	447/Simplex	Energy Department
411.7000	448/Simplex	Energy Department, Fish and Wildlife, Interior Department (Nationwide), National Park Service, TVA, US Information Agency
411.7125	449/Simplex	Energy Department
411.7250	450/Simplex	Bureau of Indian Affairs, Geologic Survey, Interior Department (Nationwide), National Park Service, TVA
411.7375	451/Simplex	Energy Department
411.7500	452/Simplex	Bureau of Land Management (Nationwide), Interior Department (Nationwide)
411.7625	453/Simplex	(No reported activity)
411.7750	454/Simplex	Bureau of Indian Affairs, Geologic Survey, Interior Department (Nationwide), National Park Service, Post Office, TVA
411.7875	455/Simplex	(No reported activity)
411.8000	456/Simplex	Agriculture Department (Nationwide), Interior Department (Nationwide)
411.8125	457/Simplex	(No reported activity)
411.8250	458/Simplex	Bureau of Land Management, Bureau of Reclamation, Energy Department, Interior Department (Nationwide), National Park Service, TVA
411.8375	459/Simplex	(No reported activity)
411.8500	460/Simplex	Air Force, Bureau of Indian Affairs, Energy Department, Interior Department (Nationwide), Office of Surface Mining, National Park Service
411.8625	461/Simplex	(No reported activity)
411.8750	462/Simplex	Bureau of Indian Affairs, Bureau of Land Management, Energy Department, Geologic Survey (Nationwide), Interior Department (Nationwide), National Park Service, TVA
411.8875	463/Simplex	(No reported activity)
411.9000	464/Simplex	Geologic Survey, Interior Department (Nationwide), National Park Service
411.9125	465/Simplex	(No reported activity)
411.9250	466/Simplex	Bureau of Land Management (Nationwide), Interior Department (Nationwide), National Park Service
411.9375	467/Simplex	(No reported activity)
411.9500	468/Simplex	Energy Department, Fish and Wildlife Service, Forest Service, Geologic Survey, Interior Department (Nationwide), National Park Service, Navy, TVA
411.9625	469/Simplex	(No reported activity)
411.9750	470/Simplex	FEMA, Geologic Survey, Interior Department (Nationwide)
411.9875	471/Simplex	(No reported activity)

Public Access Trunked Radio

Scanner listeners in the United States typically encounter one of the “big three” trunked radio systems, either Motorola, Enhanced Digital Access Communication System (EDACS), or Logic Trunked Radio (LTR). These radio formats are supported by scanner manufacturers and are relatively easy to monitor.

However, there are many other trunked radio systems operating in the world, and this month we’ll take a look at one of them.

◆ MPT 1327

In the early 1980s the Department of Trade and Industry in the United Kingdom wanted government agencies to be able purchase radio equipment from different manufacturers yet have them all work together. The Department felt that competition was healthy and would eventually provide the best value to the user. None of the existing systems they examined were acceptable, mainly because the UK wanted a non-proprietary standard that could be used by anyone without restriction.

So the UK government set about creating an open standard. In return for the cooperation of a number of equipment manufacturers, the government reallocated the old Band III television frequencies (175 MHz to 225 MHz) for public access trunked radio.

Manufacturers including GEC Marconi, Motorola, Philips and Tait joined a consortium and over a five-year period produced a series of technical specifications for a trunked radio system. These specifications begin with “MPT” (Ministry of Post and Telegraph) and are referenced by a document number. Document 1327, along with several other documents, lay out the signaling, protocols, and interfaces that make up the core of an “MPT 1327” radio system.

The first base station began full operation from London in 1987 and soon afterward a number of MPT 1327 systems were operating in Europe. Several Asian nations now have MPT 1327 networks, as do Australia, Canada, Mexico, and South Africa.

Proponents claim it is the most popular trunking radio format in the world, except for the United States. They charge that Motorola has prevented the widespread adoption of MPT 1327 in U.S. in order to benefit sales of their proprietary systems, such as Privacy Plus and SmartNet.

Since the MPT 1327 protocol is open and essentially unencumbered (outside of the U.S.) by intellectual property claims, many manufacturers produce MPT 1327 equipment and users have many vendors from which to choose. Inside the U.S., however, Motorola holds patents on key parts of MPT 1327 and has, in effect, prevented MPT 1327 from becoming widespread in their home country. Interestingly, Motorola actually builds a significant number of radios for MPT 1327 systems; however, they are for use outside of the United States.

◆ MPT 1327 Control Channels

As with most trunked radio systems, MPT 1327 has both control and voice channels.

A control channel continuously transmits digital information from a base station to mobile radios (the *outbound* or *forward* direction) 1200 bits per second using a method known as fast frequency shift keying (FFSK). Over the air, data bits are represented as audio tones, with a 1200 Hz tone acting as a ‘1’ and a 1800 Hz tone acting as a ‘0’ bit.

The control channel divided up into timeslots each containing 128 data bits. Since the bit rate 1200 bits per second, timeslot is about 107 milliseconds (just over a tenth of a second) in duration.

Each of the 128-bit control channel timeslots contains a message with instructions for one, some, or all of the mobile radios that are listening. These messages include:

ALOHA

The base station is ready to accept a call request.

AHOY

The base station is calling a mobile radio.

ACKNOWLEDGE

The message has been received.

CLEAR

End the call (referred to as a “clear down” or “tear down”).

GO TO CHANNEL

Instruct a mobile radio to switch to a particular channel.

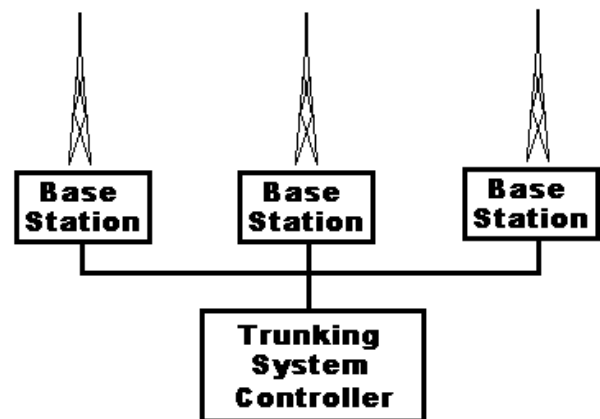
REQUEST

A mobile request to start (“set up”) a call.

When a mobile radio isn’t busy doing something, it will be tuned to the control channel and decoding the messages coming from the base station. When a mobile sends a message to the base station it will be on the *inbound* (or *reverse*) control channel.

◆ ALOHA from Hawaii

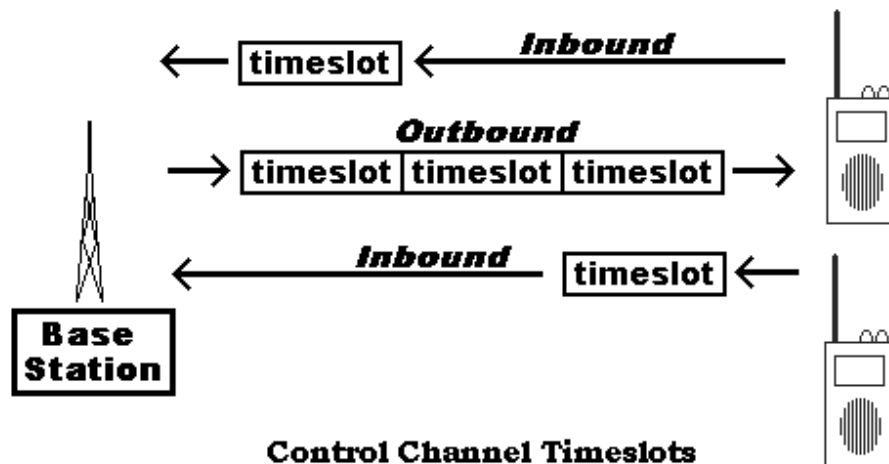
As a sidebar, you may notice that the word “ALOHA” is an odd choice for a message word. It actually comes from a series of communication experiments performed at the



Generic MPT 1327 System

University of Hawaii in the late 1960s and early 1970s. In those experiments, a central computer transmitted messages to a number of remote transceivers on a single radio frequency. These remote transceivers all communicated back to the central computer on a second, shared radio frequency. One of the problems that surfaced was, what if more than one remote transceiver wanted to use the shared frequency at the same time?

In the original system, called ALOHA, a remote transceiver simply transmitted whenever it wanted to. If it was the only one transmitting, the central computer received the



Control Channel Timeslots

message just fine and would transmit an acknowledgment back to the sender. The sender would then know that the message got through correctly.

If, on the other hand, another remote transceiver decided to transmit while the first one was transmitting, the central computer would receive only a garbled message and would not send any acknowledgments. If a remote transceiver did not get an acknowledgment back after transmitting, it was programmed to wait a random amount of time and transmit the message again. Since the random time intervals would in all probability be different for each sender, their next transmissions would most likely not interfere with each other.

A refinement of this system specified that the remote transceivers had to start their transmissions only at certain intervals, all synchronized to each other by a timing signal sent from the central computer. This further reduced the likelihood of interference and doubled the performance of the system. This refinement became known as "slotted ALOHA" and the first, simpler method was called "unslotted ALOHA."

And that's how part of Hawaii came to the United Kingdom.

◆ ALOHA and Timeslots

Anyway, an MPT 1327 base station transmits ALOHA messages on the outbound channel indicating the number of inbound control channel timeslots that are available for mobiles to use. In a relatively quiet system, this number would be 1, meaning the next timeslot is available. As the load on the system increases, this number may go to 2, meaning the next two timeslots are available. A mobile requesting service would randomly select one of two inbound timeslots in which to transmit. This effectively spreads the inbound load and reduces the chance of two mobiles interfering with each other (a *collision*, or *call clash*).

Here's a simple example of how a typical call might progress in a MPT 1327 system.

- A mobile radio wishes to contact another mobile radio.
- The calling mobile listens to the outbound control channel for the ALOHA message. It selects the proper inbound timeslot in which to transmit.
- At the proper moment, the calling mobile transmits a REQUEST with the identity of the second mobile.
- The base station responds by transmitting an AHOY message with the identity of the second mobile on the outbound channel.
- The calling mobile hears the AHOY and knows that its request was received.
- The second mobile hears the AHOY and transmits an ACKNOWLEDGE to the base station.
- The base station transmits a GO TO CHANNEL command to the mobiles, instructing them to retune to a voice channel and start their conversation.

A single control channel can typically support about two dozen voice channels and can operate in one of two ways, either dedicated or non-dedicated. A dedicated control channel is permanently available for signaling. A non-dedicated control channel may be used for traffic (voice or data) if all the other channels are busy. Typically a system with only a few channels may choose to use a non-dedicated control channel, while a system with many channels will have one or more dedicated control channels.

MPT 1327 itself can support as many as 1,024 radio channels, which leaves quite a bit of room for expansion. It also allows for more than 32,000 system identities and over a million unit addresses, which can be used for either individuals or groups. A mobile address is made up of a seven-bit prefix in the range 000 to 127 and a 13-bit identity between 2 and 8,100. A mobile radio may be programmed with several addresses for individual identification and group affiliation. In addition, a MPT 1327 radio also contains a 38-bit security number that does not change

and can be checked over the air.

Under MPT 1327, radios can make a number of different types of calls, including speech (normal or high priority), group calls, announcements, data, emergency, status messages and short data messages.

◆ Monitoring MPT 1327

Although few and far between, a number of MPT 1327 systems are currently operating in the United States, including Missouri, New York, and Texas. I'd love to give you frequencies and group identifiers, but I don't have any! So if you're monitoring these systems, send me an e-mail about what you've found.

Scanner listeners have a couple of options when it comes to monitoring MPT 1327 systems.

WiNRADiO offers a "Trunking Option" to their receiver software. This option works for Motorola Type I and II as well as MPT 1327 and uses a PC sound card to decode control channel information.

The software can operate in one of two modes, either "single-receiver" or "dual-receiver." In single-receiver mode, the unit tunes to the control channel and decodes enough information to re-tune to an active voice channel. When the transmission on the voice channel finishes, the radio switches back to the control channel and waits for the next transmission. In dual-receiver mode, two receivers are required. The first receiver stays tuned to the control channel and instructs the second receiver to tune to the proper voice channel and unmute the speaker.

The WiNRADiO Trunking Option also allows the user to log activity and automatically build up databases of trunking networks, and reportedly works with all versions of WiNRADiO receivers.

A group in Australia is also offering an MPT 1327 monitoring solution, in this case using a custom-built decoder box and software under Microsoft Windows. Audio output from your scanner is fed to the decoder, which forwards the decoded information via a serial port to the computer. A second scanner is required to actually hear the conversations, since the decoder needs the scanner to stay tuned to the control channel.

According to the website for this package, Ian Wraith developed the hardware and software in the United Kingdom, but the decoder box is being built in Australia. It lists support for WiNRADiO receivers as well as AOR 3000 and 3000A scanners and any receiver that supports the Icom CI-V interface.

More information and links are available on my website at <http://www.signalharbor.com>, and I welcome your electronic mail to dan@signalharbor.com. As always, I'd love to hear about the trunked systems you're monitoring, especially if it's MPT 1327. Until next month, happy monitoring!

Monitoring Military Flight Demonstration Groups

There is no thrill as great as watching the Blue Angels or Thunderbirds flight demonstration team strut their stuff in front of thousands of fans, unless it's adding the element of radio to the visual drama. The 2001 air show season starts this month, so we present *Milcom's* annual review of equipment to use, frequencies to monitor, and the military flight demonstration team schedules for the year (Table One).

◆ Any Old Scanner Not Will Do

Most of the handheld scanners currently being marketed are *not* suited for air show monitoring. All of the Uniden brand scanners currently being sold (except for the BC-780) cannot be used for air show monitoring due to their lack of independent mode selection. If you are going to an Air Force Thunderbird show you will need a scanner that can monitor the 138-150 MHz military land mobile band in the AM mode.

You also need a scanner that has the 225-400 MHz military aeronautical band in it. Most of the action (especially the Blue Angels) will be heard in this UHF portion of the spectrum. This criteria narrows down our choice of scanners even more.

I am frequently asked on the Grove Tech line what scanner we do recommend for air show monitoring. Below is a list of those units that we feel should be considered for this task. This list has grown considerably over last year's edition, and I am happy to report that scanner enthusiasts now have a wider range of products and prices to choose from. We have also included in this year's list base/mobile models that would be suitable for monitoring, plus a couple of inexpensive portable power supplies you can use to power these rigs at the show.

Information below includes current Grove stock codes/prices for the items indicated, but the price does not include shipping or taxes (if applicable). Prices are subject to change without notice, so be sure to call our order department at 800-438-8155 for current pricing.

Handheld Unit	Grove Stock No.	Price
Alinco DJ-X2T	SCN03	\$299.95
Alinco DJ-X10T	SCN01	\$359.95
AOR AR-8200 Mk IIB	SCN50	\$559.95
Icom R-2	SCN05	\$189.95
Icom R-3	SCN07	\$499.95
Icom R-10	SCN04	\$289.95
Yaesu VR-500	SCN06	\$324.95



Fat Albert's jet assist - Johnny Autery

Base/Mobile Unit	Grove Stock No.	Price
AOR-3000AB	SCN26	\$1062.95
AOR-5000 +3	RCV42P	\$2139.95
AOR-8600	SCN08	\$899.95
Icom R-8500	RCV14	\$1469.95
JRC NRD-545	RCV21DS/	\$1795.95
w/converter	ACC11DS	+\$349.95
Uniden BC-780		
Base/Mobile	SCN49	\$349.95
Yaesu VR-5000	RCV51	\$899.95

Computer Receivers	Grove Stock No.	Price
Icom PCR-100	RCV44	\$199.95
Icom PCR-1000	RCV45	\$349.95
WinRadio WR-1550e	RCV47-E	\$549.95
WinRadio WR-1550i	RCV47-I	\$499.95
WinRadio WR-3150e	RCV48-E	\$1849.95
WinRadio WR-3150i-DSP	RCV48-I	\$1849.95
WinRadio WR-3500e	RCV49-E	\$2395.95
WinRadio WR-3500i-DSP	RCV49-I	\$2395.95
WinRadio WR-3700e	RCV50-E	\$2895.95
WinRadio WR-3700i-DSP	RCV50-I	\$2895.95

Portable Power Sources for Base/Mobiles	Grove Stock No.	Price
WinRadio Portable Power Source	PWR05	\$199.95
Portable Power Station	PWR01	\$69.95

Another purchase you should consider is an extra set of charged batteries for your handheld. Murphy's law ensures that your NiCads will die half way through the show with your replacements at home in the shack.

Finally, if you'd like to see this list expanded to include used equipment or antennas, let me know and we'll show them next year. Email to: larry@grove-ent.com.

◆ So where is the action?

You will need to concentrate on three different bands for air show activity. Search in the 138-150.8 MHz band (minus 144-148, in both the AM and Narrow FM modes in 12.5 kHz steps), 118-136 MHz (AM mode in 25 kHz steps), and finally 225-420 MHz (AM in 225-400 in 25 kHz steps/Narrow FM in 406-420 MHz in 12.5 kHz steps).

The following discrete frequencies were reported in use by the U.S. Navy Blue Angels during the previous two seasons.

U.S. Navy Blue Angels

Frequency	Usage
142.000	Ground support (Comm Cart)
143.600	Ground support, occasional Air-to-Air reported here
164.900	Engine Start/Taxi Out Ground support (Comm Cart)
168.900	Engine Start/Taxi Out Ground support (Comm Cart)
169.400	Engine Start/Taxi Out Ground support (Comm Cart)
170.900	Engine Start/Taxi Out/Maintenance Ground support (Comm Cart)
236.450	Miscellaneous Air-to-Air (Eastern U.S.)
238.150	Show center/Delta formation (Eastern U.S.)
251.600	Solo formation (Aircraft 5/6) Air-to-Air
256.250	Usage unknown
263.350	Fat Albert (Blues C-130 Transport Aircraft), plus FA JATO flight demonstrations
263.500	Blue Angels/Fat Albert
264.550	Diamond/Solo formations
275.350	Diamond formation (Aircraft 1-4) Air-to-Air
286.000	Usage unknown
302.150	Miscellaneous Air-to-Air (Western U.S.)
307.700	Show center/Delta formation (Western U.S.)
321.100	Blue Angel Operations
345.900	Solo formation (Aircraft 5-6) Air-to-Air

The U.S. Air Force Thunderbirds are always a crowd favorite. The following frequencies have been reportedly used by the Thunderbirds during the last couple of seasons.

U.S. Air Force Thunderbirds

140.400	Support Aircraft: Cross Country Air-to-Air
141.850	Four ship formation (Victor 1) Show Air-to-Air which is linked to public address system (AM mode)
143.850	Four ship formation (Victor 2) air-to-air which is linked to public address system (AM mode)
235.250	Thunderbird Control
269.900	Thunderbird Control to Air Boss
322.950	Solo aircraft (5-6) Show Air-to-Air
413.025	Maintenance/ground teams <channel 1> (NFM 146.2 PL tone)
413.100	Maintenance/ground teams <channel 2>

Both the Navy and the Air Force have aircraft special demonstration units in addition to the flight demonstration units mentioned above. Here is a list of known units and their frequencies.

US Air Force A-10	Flight Demo Teams (Nationwide): 32.350 34.125 34.175 34.375 34.575 36.150 36.350 36.850 38.670 40.200 46.650 49.750 139.675 140.000 (all tentative identifications, confirmation requested)
US Air Force F-15	Flight Demo Team (Misc): 275.675
US Air Force F-15	Flight Demo Team (East): 228.450 233.525 238.825 252.775 257.075 264.975 276.675 282.675 282.800 (S) 298.350 359.225
US Air Force F-15	Flight Demo Team (West): 384.550

US Air Force F-16 Flight Demo Teams (Show units): 260.400 282.800
US Air Force F-117 Flight Demo Discrete: 304.900 (very tentative)
US Navy F-14 Flight Demo Teams: 299.500 311.500 341.200 342.900
 342.950 345.000
US Navy F/A-18 Flight Demo Teams: 333.300 (very tentative)
US Coast Guard Rescue Demo Teams: 381.800

◆ Military Parachute Teams

The colorful U.S. Navy Seal Parachute Team, known as the Leap Frogs, are frequent visitors around the country at various sporting events and air shows. Look for their communications on 407.500 MHz.

The U.S. Army Parachute Team is known as the Golden Knights. They also make the rounds during the air show season. Look for their communications on 123.400, 123.475 or 123.500 MHz. You should also keep an eye on 32.300, 122.575, and 367.700 MHz for possible activity.

◆ Foreign Air Demonstration Teams

The Canadian Forces aircraft demonstration team is known as the Snowbirds. The following have been recently reported for this popular aerial team: 246.500, 272.100, 299.500, and 333.300 MHz.

Several years ago Daryll Symington in his popular book *Monitoring The Military* had the channel list below for the Snowbird team. It is unknown how accurate that list is now and we provide it here only for reference purposes.

227.600 (F4), 236.600 (F15), 239.800 (F20), 240.500 (F6), 245.000 (F19), 245.700 (F11), 266.300 (F8), 272.100, 275.800 (F1), 283.900 (F16), 289.400 (F18), 294.500 (F9), 295.600 (F2), 310.800 (F3), 316.500 (F12), 322.800 (F10), 344.500 (F13), 356.600 (F14), 363.800 (F17), 378.500 (F7)

Some other foreign and US flight demonstration teams that have been reported to us this last year include:

130.500	Spanish Military Aguila Flight Demonstration Team
136.175	Chilean Military Halcones Flight Demonstration Team
136.975	UK Army Air Corps Blue Eagles Helicopter Flight Demonstration Team
138.450	France Air Force La Patrouille Adecro Flight Demonstration Team
141.825	France Air Force La Patrouille Adecro Flight Demonstration Team
143.100	France Air Force La Patrouille Adecro Flight Demonstration Team
243.450	UK Air Force Red Arrows Flight Demonstration Team
252.500	Spanish Military Aguila Flight Demonstration Team
255.100	UK Air Force Falcons Flight Demonstration Team
264.400	Turkish Military Stars Flight Demonstration Team
279.600	Turkish Military Stars Flight Demonstration Team
288.850	Swiss Military Patrouille Suisse Flight Demonstration Team
307.800	Italian Military Frece Tricolori Flight Demonstration Team
465.100	UK Air Force Falcons Flight Demonstration Team
469.500	US Confederate Air Force Tora Team
469.550	US Confederate Air Force Tora Team

During the 2000 season we want to hear from our readers about active demonstration/air show frequencies. If you attend an air show, *please pass along what you hear!* You can reach me via e-mail at larry@grove-ent.com with a subject line of *Airshow Intercepts*, or you can write us at: Milcom, P.O. Box 98, Brasstown, NC 28902.

Thanks to our many contributors who took the time to share their air show reports with us last year. In the meantime, we will see you again in two months and good hunting to all.

Table One: Military Demonstration Teams 2001 Performance Schedule

Demonstration schedules dates are subject to change.

Group Abbreviations

BA=USN Blue Angels
 TB=USAF Thunderbirds
 SB=Canadian Snowbirds
 GKBT=Golden Knights, Black Team
 GKGT=Golden Knights, Gold Team
 GKHQ=Golden Knights Headquarters Unit

Base Abbreviations

AFB = Air Force Base
 ANG=Air National Guard
 ARB = Air Reserve Base
 JRB=Joint Reserve Base
 MCAS = Marine Corps Air Station
 NAF = Naval Air Facility
 NAS=Naval Air Station

Dates

March 10
 March 15-16

March 17-18

March 18

March 21

March 24

March 24-25

March 25

March 31-April 1

April 7

April 7-8

April 8

April 14-15

April 21-22

April 21

April 22

April 28-29

May 4-6

May 5-6

May 10

May 12

May 12

May 12-13

May 13

May 16

May 18

May 19

May 19-20

May 23

May 23 & 25

May 26-27

May 27

May 30

June 2-3

June 9

June 9-10

June 10

June 12

June 14

June 16-17

June 20

June 22-24

June 23-24

June 27

June 29-30

June 30

Group: Locations

BA: NAF El Centro, CA
 GKGT: Style Team LULAC Youth Conference, Tucson AZ
 BA: Mesa, AZ
 GKBT: Boy Scout Jamboree Atlanta, GA
 GKHQ: Army NASCAR Introduction Stanley, NC
 TB: Patrick AFB, FL
 BA: Altus AFB, OK; GKBT: Punta Gorda, FL; GKGT: Riverside, CA
 TB: Tyndall AFB, FL
 BA: MCAS Cherry Point, NC; TB: Glendale, AZ; GKBT: Tyndall AFB, FL; GKGT: Augusta, GA
 TB: NAS Point Mugu, CA
 BA: MacDill AFB, FL
 TB: Beale AFB, CA
 GKBT: Chattanooga, TN
 BA: NAS Corpus Christi, TX
 TB: Barksdale AFB, LA
 TB: Maxwell AFB, AL
 BA: NAS Norfolk, VA; TB: Lincoln ANG Base, NE; SB: Robins AFB, GA; GKBT: Fort Sam Houston San Antonio, TX; GKGT: Altus, OK
 SB: Ft Lauderdale, FL
 BA/GKGT: Ft. Lauderdale, FL; GKHQ: 600 Festival Concord, NC
 SB: Shaw AFB, SC
 SB: Sudbury, ON
 TB: Millington, TN
 GKBT: March ARB, CA; GKGT: Knoxville, TN
 TB: Ft. Smith, AR
 SB: Warton, ON
 GKGT: Pentagon Jump
 BA: Charleston AFB, SC
 TB/GKGT: Andrews AFB, MD; SB: Mont Laurier, PQ; GKBT: "Indy 500 Time Trials" Indianapolis, IN
 SB: Peterborough, ON
 BA: US Naval Academy Annapolis, MD
 BA: NAS Patuxent River, MD; TB/GKBT: Columbia, MO; SB: Barrie, ON; GKGT: Randolph AFB, TX
 GKHQ: Coca-Cola 600 Charlotte Motor Speedway Charlotte, NC
 TB: US Air Force Academy, CO
 BA: Lakehurst, NJ; TB: NAS Fallon, NV; SB: Ottawa, ON; GKBT: Belfield, ND; GKGT: Scott AFB, IL
 TB: Hill Air Force Base, UT
 BA/SB: Quebec City, PQ; GKBT: Grantsville, UT; GKGT: Belmont, NY
 TB: Cannon Air Force Base, NM
 SB: Kingston, ON
 SB: Elliot Lake, ON; GKBT: San Diego Padres Game, CA; GKGT: NY Yankees Game, NYC
 BA: Syracuse, NY; TB: McChord AFB, WA; SB: Hamilton, ON; GKBT: McConnell AFB, KS; GKGT: Willow Grove, PA
 SB: Leamington, ON
 SB: London, ON
 BA: Davenport, IA; TB: Tullahoma, TN; GKBT: McChord AFB, WA; GKGT: Van Nuys, CA
 SB: Annapolis, ON
 SB: St Hubert, PQ
 TB: Scott AFB, IL; GKGT: Ft Drum NY

June 30-July 1

July 1

July 4

July 7-8

July 13-14

July 14

July 14-15

July 15

July 21-22

July 25

July 28

July 28-29

July 29

August 1

August 4-5

August 8

August 10

August 11

August 11-12

August 12

August 18-19

August 19

August 21

August 23

August 25

August 25-26

August 26

August 29

September 1

September 1-3

September 6

September 8

September 8-9

September 9

September 11

September 13

September 15

September 15-16

September 16

September 16-17

Sept 20-Oct 28

September 22-23

September 26

September 29

September 29-30

October 3

October 6-7

October 7

October 10

October 13-14

October 20-21

October 27-28

November 3

November 3-4

November 4

November 7

November 9-10

November 10-11

November 16-18

BA: Evansville, IN; GKBT: Travis AFB, CA; GKGT: Clayton, NY
 TB: Niagara Falls, NY; SB: Canada Day - Ottawa, ON
 TB/SB: Battle Creek, MI
 BA: Muskegon, MI; TB: Pope AFB, NC; SB: Moose Jaw, SK; GKBT: Opsail 2000, NYC; GKGT: Cape Girardeau, MO
 BA: Pensacola Beach, FL
 TB: Columbus AFB, MS
 GKBT: Pensacola, FL; GKGT: Davenport, IA
 TB: San Angelo, TX
 BA: Bozeman, MT; TB/GKBT: Dayton, OH; SB: Fort St. John, BC; GKGT: Selfridge, MI
 TB: Cheyenne, WY; SB: Smithers, BC
 SB: Kelowna, BC
 BA: NAS Lemoore, CA; TB: Latrobe, PA; GKBT: Billings, MT; GKGT: Elmendorf AFB, AK
 SB: Comox, BC
 SB: Trail, BC
 BA: Seattle, WA; TB: Otis ANG Base, MA; SB: Red Deer, AB; GKBT: North Bay, ON; GKGT: Mountain Home, ID
 SB: Cranbrook, BC
 SB: Abbotsford, BC
 TB: Minot AFB ND
 SB: Abbotsford, BC; GKGT: Westover MA
 TB: Ellsworth, AFB, SD; GKBT: Champlain Valley, VT
 BA: Kansas City, MO; TB: Chicago, IL; SB: Lethbridge, AB; GKBT: Bloomington, IL
 GKGT: National Science Center Augusta, GA
 GKBT: "Army Night" Cominsky Park Chicago, IL
 SB: Windsor, ON; GKBT: Saratoga, NY
 SB: St. George, PQ
 BA: Duluth, MN; TB: Mid-season break; GKBT: Rochester, NY; GKGT: Offutt AFB, NB
 SB: Mont Joli, PQ
 SB: Brantford, ON
 GKGT: VA Tech vs Akron Blacksburgh, VA
 BA/GKBT/GKGT (3rd only): Cleveland, OH; TB: Bay St. Louis, MS; SB: Toronto, ON
 SB: Fredrickton, NB
 TB: Muskogee, OK
 BA: NAS/JRB Willow Grove, PA; SB: Shearwater, NS; GKGT: Smyrna, TN
 TB: Sioux City, IA; GKBT: Colorado Springs, CO; GKBT: Kirkland, NM
 SB: Stevensville, NF
 SB: Deer Lake, NF
 GKBT: 100th Airborne Div Louisville, KY; GKGT: Houston VS USMA
 BA: Smyrna, TN; TB: Salinas, CA
 GKBT: "Motorola 300 CART FedEx Series" St. Louis, MO
 SB: Sault St. Marie, ON
 TB: Pacific Tour (Specific locations to be announced)
 BA: NAS Brunswick, ME; SB/GKBT: NAS Oceana, VA; GKGT: Elmira, NY
 SB: Wolfville, NS
 BA: NAS Meridian, MS; GKBT: University of Delaware Dover, DE
 SB: St. Catherine's, ON; GKGT: Liberal, KS
 SB: Aspen, CO
 BA: San Francisco, CA; SB: Page, AZ; GKGT: Fort Worth, TX
 GKBT: Laughlin AFB TX
 SB: Tucuman, NM
 BA/GKBT: MCAS Miramar, CA; SB/GKGT: El Paso, TX
 BA: Alliance Field Fort Worth, TX; GKBT: Moody AFB, GA; GKGT: Langley AFB, VA
 BA: Lafayette, LA; GKBT: Kings Park, NY; GKGT: New Orleans, LA
 TB: Seymour-Johnson AFB, NC
 BA/GKBT: Jacksonville Beach, FL; GKGT: Keesler AFB-Biloxi, MS
 TB: Moody AFB, GA
 GKBT: Ft Bragg Safety Fair, NC
 BA: NAS Pensacola, FL
 TB: Daytona Beach, FL; GKGT: Columbia, SC
 GKBT/GKGT: "Black and Gold Parachute Competition" Raeford, NC

Stamp Collecting and DX

Suppose these two hobbies don't seem to have a whole lot in common these days, unless you collect the stamps used on your verification letters. But, back in the 1920s many DXers did collect a special type of stamp.

AM broadcast DXing was a very popular pastime in the 20s. Many larger cities had only a handful of stations. Smaller cities often had none at all. If you wanted variety in programming, you had to look for out-of-town stations.

The EKKO Company of Chicago found an opportunity. They began printing stamps to be provided by radio stations when they verified a distant listener's report; and they printed albums for the listeners to collect the stamps in. A co-worker of reader Bruce Rodgers found one of these albums in his grandfathers' effects, and the stamps in it show how both DXing and radio itself have changed in the last 75 years.

The page shown was for stamps from stations in Illinois. You probably can't tell from the small picture, but each space was set aside for a specific station. All the stations on this page were in Chicago except for WCBD, which was located at Zion, Illinois.

Many of the stamps this listener collected were from stations that are still familiar today; WBBM, WMAQ, WMBI, WLS. WCFL, WMAQ, and WJJD may not be around today, but I'm sure many readers remember them. The WLIB that existed in the 1920s is not connected with the station of the same callsign that exists in New York City today; nor is there any connection between WCBD and the TV station using that callsign in Charleston, SC.

Of course, I'm sure a lot of you will wonder about the very first stamp on this page! KYW is a familiar call to modern DXers in the East, but everyone knows it's in Philadelphia, not Chicago. Few are aware that this famous callsign got its start 680 miles to the east of the Windy City; it moved in 1934.

Bruce suggests it probably wouldn't be possible to do something like this today, and he's probably right. But the EKKO Company did write in the instructions for the stamp al-

bum that they would provide a stamp on behalf of a station if you sent them a copy of your verification; maybe some enterprising DXer sees a new opportunity?



These "EKKO" verification stamps from Illinois stations were collected by a DXer in the late 1920s.

LPFM News

There's big news in the LPFM department this month. Just before Christmas, a modified version of the Oxley anti-LPFM bill passed Congress as a rider on a budget bill, and President Clinton signed it. (Clinton was opposed to the anti-LPFM legislation but apparently felt the rest of the bill was important enough to sign.) The act prohibits the FCC from relaxing protection for stations 0.6 MHz away from full-license stations, and it prohibits the FCC from allowing former pirate station operators to operate LPFMs.

While this legislation will severely restrict the number of LPFM stations that are possible, it doesn't eliminate LPFM en-

tirely. A few days later, the FCC released a list of 255 applicants whose facilities could be granted under the new law, and which were not mutually-exclusive with any other LPFM applicants. People or entities objecting to the proposed stations had until January 22 to file petitions to deny; it is likely that by the time you read this, some LPFM permits will have been granted and some stations will be on the air. See http://www.fcc.gov/Bureaus/Mass_Media/Public_Notices/FM_Windows/pnmm0084.html for more information including a list of applicants.

New Stations

There are also some new stations this month. On the expanded AM band, KWHN-1320 Fort Smith, Arkansas, has moved to 1650 kHz. They're simulcasting their 1320 kHz facility, which has switched callsigns to KWYN. The format is news/talk. Not too far away in Atlanta, Texas, the only full-power station to be authorized on 1610 kHz is on the air. KALT is carrying right-wing talk programming and Fox Sports. Both new stations have been widely heard.

In Canada, two long-silent frequencies have returned to the air. Sheldon Harvey reports 1220 kHz in Cornwall, Ontario, back on the air. This frequency used to belong to CJSS, which moved to FM some time ago. It's been reincarnated as CJUL, "The Jewel," with a nostalgia format.

Probably more important to the Eastern DXer, the old CBC frequency of 740 kHz in Toronto is back on the air. This is also a nostalgia-formatted station. The station had requested CFPT, but those calls were denied, so they'll use the calls from their old 1250 kHz frequency, CHWO. 1250 is to become religious CJYE. It's probably an aural illusion, but I think this station is considerably stronger here in Tennessee than it was as CBL.

Bits and Pieces

Do you have any interesting DX memorabilia? Write me at Box 98, Brasstown NC 28902-0098, or by email to w9wi@w9wi.com. Good DX!

USA-Sponsored Clandestine Activity Increasing

One of former President Bill Clinton's last acts, according to the *Washington Post*, was to authorize an expansion of USA-financed clandestine broadcasting. *Clandestine Radio Watch* has already reported the sign-on of "Experimental Radio From the Mediterranean Basin," a pro-Israel and anti-Hizbullah clandestine on 756 kHz. Insiders tell *MT* that even more clandestine activity is highly likely under President Bush's administration.

Meanwhile, the *Washington Post* reported that some Cuban numbers stations have been confirmed as spy transmissions, with the spies using PCs to decode the messages. 2001 is already an exciting year for unlicensed broadcast listening!

❖ Winter SWL Fest

It's time once again for the Winter SWL Festival in Kulpville, PA, on March 9-10, 2001. Sponsored by the North American Shortwave Association, this is the world's largest annual family reunion of DXers. At the fourteenth annual Fest, unlicensed broadcast DXing will again be part of the fare. Some *Monitoring Times* columnists will be present in Philadelphia. Why not join us?

If you need Fest information, check <http://www.trsc.com/winterfest.html> on the web. You can write to them at PO Box 4153, Clifton Park, NY 12065.

❖ What We Are Hearing

MT readers again logged over two dozen stations in a crowded North American pirate band, all between 6940 and 6955 kHz. Your best bet is to tune these frequencies on weekends, two to four hours before or after local sunset.

CKLW- The historic Windsor, Ontario, rocker is long gone on 800 kHz, but it still stimulates pirate memorials. (None currently)

Eat It Radio- As you might expect from the ID, this one is a parody station. (None)

Ground Zero Radio- They put a lot of work into complex productions of drama, parodies, and music. (Blue Ridge Summit)

Happy Hanukkah- They seem to always return around the holidays; this year was no exception. (Merlin)

KIPM- You know that you have an impact when other pirates parody you. Their long dramas generated a parody

by WHYP. (Elkhorn)

KMUD- Best heard on the west coast, they normally feature music. (Belfast)

KRMI- Radio Michigan International's seasonal holiday programs supplemented their normal rock music. (uses KRMI6955@hotmail.com e-mail)

NOEL- Guess which holiday is promoted by this station with the four letter call sign? You're right, and you may already be a winner! (None)

Prime Time Radio- Toronto's new 740 kHz medium wave station got several free pirate relays. ODXA is handling MW reports, but not pirate correspondence. (None)

Radio Alpha Lima- Perhaps the best heard Europirate in North America this year; you can try for them around 6210 and 21890 kHz. (Hoogeveen)

Radio Azteca- Bram Stoker has produced 40 different shows of DX humor and side-splitting parody. If you log this one, don't touch that dial! (Belfast)

Radio Bingo- Their programming has expanded, with bingo games are now accompanied by humor sketches. (uses radiobingo@chek.com e-mail)

Radio Free Euphoria- Captain Ganja sent in this month's photo, which promotes the Winter SWL Festival. (Belfast)

Radio Free Speech- Bill O. Rights' new AM transmitter sometimes features his own advocacy for individual freedom, but he now relays other stations too. (Belfast)

Radio Neptune- The only active pirate that is named for a planet features rock and comedy from Earth. (Blue Ridge Summit)

Radio Tellus- The *Earth Station*, a classic pirate, is back with rock after several years of silence. (Providence)

Radio Three- Sal Amoniac's moldy pop/rock oldies are insipid, but his ironic humor adds fun. (None; only verifies loggings in *The ACE*)

RBCN- Radio Bob still airs his own pirate shows, but sometimes he's parodied by impostors. (Lula)

Sycko Radio- Don't be fooled by the spelling of Psycho Radio. They have increased their comedy content, but still use no maildrop. (None)

Take it Easy Radio- They took it easy with comedy as the new year dawned. (Belfast)

Voice of the Angry Bastard- Their shows are mainly rock music, so it's hard to say what they are mad at. (Belfast)

Voice of the Epileptic Catfish- This extremely rare one appears only once every five years. This time the Catfish inhabited the Europirate band on 6300 kHz. (None)

WDRR- Music dominates their shows with a "Desperate Rock and Roll" slogan. (Belfast)

WHYP- James Brownyard remains the most active shortwave pirate, with his signature weather reports and grunting noises. (uses whyp1530@yahoo.com e-mail)

WLS- Montgomery Ward is bankrupt, and Sears' "World's Largest Store" theme no longer rocks on 890 kHz from Chicago. But, pirates keep the memory alive. (None)

WMOE- Their call letters come from the Three Stooges, but the shows are a mix of music and ID's. (uses wmo6955@yahoo.com e-mail)

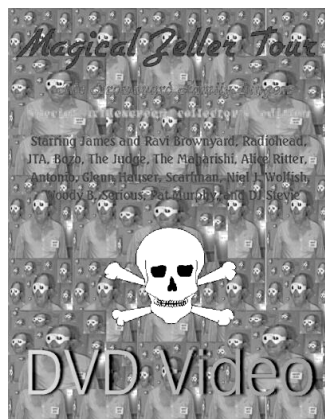
Z-Rock- This professionally produced replica of a commercial FM broadcaster is still around. (None)

❖ Reports and QSLs

Reception reports to pirate stations require three first class stamps for USA maildrops or \$2 US to foreign locations. This finances postage for a souvenir QSL to your mailbox. Send your letters to these addresses: PO Box 1, Belfast, NY 14711; PO Box 28413, Providence, RI 02908; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 69, Elkhorn, NE; 68022; PO Box 24, Lula, GA 30554; PO Box 293, Merlin, Ontario N0P 1W0; and PO Box 663 7900ar Hoogeveen, Netherlands. A few pirates, as listed, prefer e-mail, bulletin logs or internet web site reports instead. Reports to the *Free Radio Network* go to <http://www.frn.net/> on the web. *Free Radio Weekly* loggings go via niel@ican.net e-mail. Sample copies of *The ACE* are \$2 via the Belfast maildrop.

❖ Thanks

Your input is always welcome via PO Box 98, Brasstown, NC 28902, or via my e-mail address atop the column. This month we heard from Alfred (Alpha Lima), Hoogeveen, Netherlands, John T. Arthur, Belfast, NY; Lee Banner, Fishkill, NY; Jerry Berg, Lexington, MA; Ranier Brandt, Hoeser, Germany; Jerry Coatsworth, Merlin, Ontario; Ross Comeau, Andover, MA; Joe Filipkowski, Providence, RI; Harold Frodge, Midland, MI; Captain Ganja, Belfast, NY; Pete Greene, Cleveland, OH; William T. Hassig, Mt. Prospect, IL; Vince Havrilko, Beale AFB, CA; Hans Johnson, AZ; Jim Keeling, St. Charles, MO; Debbie Kinloch, Toronto, Ontario; Chris Lobdell, Stoneham, MA; Ben Loveless, Bloomfield, MI; Greg Majewski, Oakdale, CT; Bill McClintock, Minneapolis, MN; Cachito Marnani, Santiago, Chile; Adrian Peterson, Indianapolis, IN; Mike Prindle, New Suffolk, NY; Lee Reynolds, Lempster, NH; Martin Schoech, Merseburg, Germany; Lee Silver, Mentor, OH; Bud Stacey, Setsuma, AL; DJ Stevie, Basel, Switzerland; Niel Wolfish, Toronto, Ontario; and Dave Zantow, Janesville, WI.



Can You Hear the Lowfers?

The term “Lowfer” was coined by the late Ken Cornell, W2IMB, during the 1970s. It’s shorthand for “Low Frequency Experimental Radio Station” and refers to those stations (and operators) frequenting the 160-190 kHz license-free band. The term caught on, and today there are over 70 operators in North America who wear the “Lowfer” badge with honor.

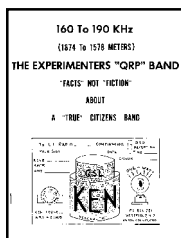
◆ Looking Back

In late 1950s, the FCC established 160-190 kHz as a band where unlicensed operation was permitted under certain restrictions. Chief among them were the requirements to use no more than one watt of input power and an antenna length of no more than 50 feet (including the feedline).

Although the band had been used for intercoms, remote control devices, and other short-range utility applications for some time, it was not until the late 1960s that radio buffs took a serious look at the spectrum.

A few articles on 160-190 kHz appeared in ham and electronic magazines during the late 1960s and early ‘70s. This sparked interest among a handful of experimenters searching for new challenges. On the East Coast, Ken Cornell (NJ) and a few experimenters in Connecticut and New York were among the first to explore the band. (It may be a surprise to many that this group conducted a three-state, five-way QSO in April of 1972 – a feat considered rare even today!)

Ken Cornell became a leader in the longwave



hobby and went on to publish 10 editions of the *Low & Medium Frequency Radio Scrapbook* from 1972 to 1997. The book became the standard reference for serious experimenters and is still in demand today. (Sadly, the book has been out of print for several years, and I am

not aware of any plans to republish it – K.C.)

Ken Cornell’s first book on the 160-190 kHz experimenter’s band later became known as the *Low & Medium Frequency Radio Scrapbook*. Ten editions were produced between 1972 and 1997.

◆ Today’s Activity

Activity on the 160-190 kHz band (1750 meters) is enjoying new popularity with the creation of new transmitting modes and the hope of an LF ham band (now under consideration

by the FCC).

Standard keyed-carrier CW is the dominant mode for most Lowfer operations. However, you are also likely to find digital modes being used, such as BPSK (Binary Phase Shift Keying) and a mode called QRSS, which is very slow CW (less than 1 wpm) intended for reception by computers.

Computerized modes lend themselves well to unattended monitoring of Lowfer beacons. With the appropriate software, it is now possible to set your computer up to “listen” for a signal through the night or at any time when you’re not at the controls. When you return, you can check the results on the screen. For more information on these modes, including links to downloadable software, check the Longwave Club of America (LWCA) web site at www.lwca.org.

Are there Lowfers operating near you? Table 1 lists the North American stations believed to be active at this writing. This information was obtained via the web at www.highnoonfilm.com/xmgr/beacons.htm. Check this site for additional information on Lowfers and updates to the operator’s list.

When trying for any of these stations, headphones, a good low-noise antenna, and a narrow filter bandwidth are very helpful. As with any weak signal work, very slow tuning is also recommended. It may take ten minutes or more to do a serious bandscan of 160 to 190 kHz. Happy hunting!

Table 1. Lowfers in North America

IDENT	FREQ.	LOCATION
HTTP	160.000	Wales Center, NY
GSD	170.000	Gary, SD
NF	172.400	New Freedom, PA
NUT	174.000	Simi Valley, CA
8TXT	174.600	Sandusky, OH
D	175.000	Des Moines, IA
5FEK	175.000	Bixby, OK
CA	176.000	Carmel, NY
RLD	176.330	Stanfield, NC
NC	177.777	Stanfield, NC
MPK	177.900	Chittenango, NY
ZWI	178.600	Baldwinsville, NY
K3DI	180.000	Arnold, MD
IJZ	181.167	San Gabriel, CA
RL	181.620	Herndon, VA
BRO	182.200	Duluth, MN
UD	182.500	Wakefield, QC
NR	182.516	Riverside, CA
TFQ	182.700	Centertown, KY
A30	182.900	Monroeville, PA
PRK	183.160	Saratoga, CA
3ZIM	183.333	N. Toronto, ON
PLI	183.500	Burbank, CA

ELU	183.500	Simi Valley, CA
ZTM	183.500	Layton, UT
MEL	183.544	San Jose, CA
YWK	184.320	Dallas, GA
RI	184.320	Rifton, NY
JDH	184.500	Bonaire, GA
R	184.877	Durant, OK
KC	185.000	Bloomfield, NY
FAW	185.185	Riverton, UT
WA	185.300	Andover, MA
RED	185.500	Wausau, FL
3SCO	185.900	Scarborough, ON
YK	185.970	Evansville, IN
GW	186.000	Athens, OH
BA	186.375	Lancaster, IL
LEK	186.700	Aitkin, MN
1A	186.713	Marshfield, MA
MS	186.800	Scottsburg, IN
VPMO	186.890	Valley Park, MO
RB	186.920	Freeport, IL
BOB	186.986	Mahomet, IL
M	187.088	Brawley, CA
1LF	187.300	Calera, AL
HM	187.370	Prescott, AZ
DCH	187.352	Berlin, MD
BK	187.450	Shell Lake, WI
YD	187.500	White City, FL
K	187.500	S. Coffeyville, OK
MV	187.600	Little Falls, NY
HDO	187.650	Morro Bay, CA
MOO	187.780	Monroeville, NJ
VA	187.800	Smith Mtn. Lake, VA
DJL	188.000	Newbury Pk., CA
YHO	188.150	Mason, OH
QYV	188.570	Donora, PA
GIR	189.200	New Eagle, PA
SAM	189.200	Crystal, MN
ARK	189.300	Leslie, AR
TH	189.360	Colts Neck, NJ
XMGR	189.500	Helena, AL
LP	189.550	Riviera Beach, MD
IDF	189.600	Idaho Falls, ID
TEXAS	189.700	Haslet, TX
RM	189.800	Duluth, MN
OK	189.950	Davenport, OK

◆ New Catalog Available

Universal Radio, Inc. (<http://www.universal-radio.com>) is well known to most utility monitors. Over the years they’ve supported the hobby through a wide variety of books, equipment and innovative accessories – many of which are geared towards longwave and mediumwave reception. Their web site is also an excellent source for tutorial information on all facets of radio monitoring.

Universal recently announced that their 2001 Communications Catalog (#01-01) is ready for shipment. It is available free in North America by fourth class mail and is available outside North America for five International Reply Coupons (IRCs). Contact Universal via their web site, or write them at 6830 Americana Pkwy, Reynoldsburg, Ohio 43068-4113.

Big Savings on Radio Scanners

Uniden® NEW!



Bearcat® 780XLT EV Trunk Tracker III

Mfg. suggested list price \$529.95

Less - \$205 Instant Rebate / Special \$324.95
500 Channels • 10 banks • CTCSS/DCS • S Meter

Size: 7 5/8" Wide x 6 15/16" Deep x 2 13/16" High

Frequency Coverage: 25.0000-512.0000 MHz., 806.000-823.9875 MHz., 849.0125-868.9875 MHz., 894.0125-1300.000 MHz.

When you buy your Bearcat 780XLT EV Trunk Tracker package deal from Communications Electronics, you get more. The EV means "Extra Value." With your BC780XLT scanner purchase, you also get a **free deluxe scanner headphone** designed for home or race track use. Headset features independent volume controls and 3.5 mm gold right angle plug. The Bearcat 780XLT has 500 channels and the widest frequency coverage of any Bearcat scanner ever. Packed with features such as TrunkTracker III to cover EDACS, Motorola and EF Johnson systems, control channel only mode to allow you to automatically trunk many systems by simply programming the control channel, S.A.M.E. weather alert, full-frequency display and backlight controls, built-in CTCSS/DCS to assign analog and digital subaudible tone codes to a specific frequency in memory, PC Control with RS232 port, Beep Alert, Record function, VFO control, menu-driven design, total channel control and much more. Our CEI package deal includes telescopic antenna, AC adapter, cigarette lighter cord, DC cord, mobile mounting bracket with screws, owner's manual, trunking frequency guide and one-year limited Uniden factory warranty. For maximum scanning enjoyment, order magnetic mount antenna part number ANTMMBNC for \$29.95. Not compatible with AGEIS, ASTRO or ESAS systems. For fastest delivery, order on-line at www.usascan.com.

Bearcat® 895XLT Trunk Tracker

Mfg. suggested list price \$499.95

Less - \$320 Instant Rebate / Special \$179.95
300 Channels • 10 banks • Built-in CTCSS • S Meter

Size: 10 1/2" Wide x 7 1/2" Deep x 3 3/8" High

Frequency Coverage: 29.000-54.000 MHz., 108.000-174 MHz., 216.000-512.000 MHz., 806.000-823.995 MHz., 849.0125-868.995 MHz., 894.0125-956.000 MHz.

The Bearcat 895XLT is superb for intercepting trunked communications transmissions with features like TurboScan™ to search VHF channels at 100 steps per second. This base and mobile scanner is also ideal for intelligence professionals because it has a Signal Strength Meter, RS232C Port to allow computer-control of your scanner via optional hardware and 30 trunking channel indicator annunciators to show you real-time trunking activity for an entire trunking system. Other features include Auto Store - Automatically stores all active frequencies within the specified bank(s). Auto Recording - Lets you record channel activity from the scanner onto a tape recorder. CTCSS Tone Board (Continuous Tone Control Squelch System) allows the squelch to be broken during scanning only when a correct CTCSS tone is received. For maximum scanning enjoyment, order the following optional accessories: PS001 Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter \$14.95; PS002 DC power cord - enables permanent operation from your vehicle's fuse box \$14.95; MB001 Mobile mounting bracket \$14.95; EX711 External speaker with mounting bracket & 10 feet of cable with plug attached \$19.95. The BC895XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited Uniden warranty. Not compatible with AGEIS, ASTRO, EDACS, ESAS or LTR systems.



SCANNERS

Bearcat® 245XLT Trunk Tracker II

Mfg. suggested list price \$429.95/CEI price \$189.95

300 Channels • 10 banks • Trunk Scan and Scan Lists

Trunk Lockout • Trunk Delay • Cloning Capability

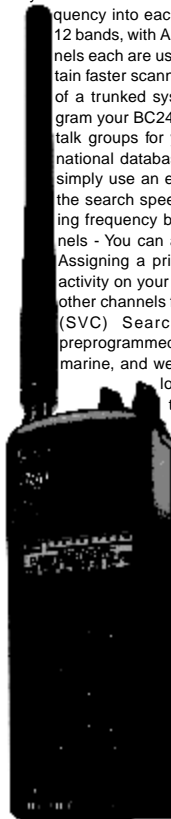
10 Priority Channels • Programmed Service Search

Size: 2 1/2" Wide x 1 3/4" Deep x 6" High

Frequency Coverage:

29.000-54.000 MHz., 108-174 MHz., 406-512 MHz., 806-823.995 MHz., 849.0125-868.995 MHz., 894.0125-956.000 MHz.

Our Bearcat TrunkTracker BC245XLT, is the world's first scanner designed to track Motorola Type I, Type II, Hybrid, SMARTNET, PRIVACY PLUS and EDACS® analog trunking systems on any band. Now, follow UHF High Band, UHF 800/900 MHz trunked public safety and public service systems just as if conventional two-way communications were used. Our scanner offers many new benefits such as Multi-Track - Track more than one trunking system at a time and scan conventional and trunked systems at the same time. 300 Channels - Program one frequency into each channel. 12 Bands, 10 Banks - Includes 12 bands, with Aircraft and 800 MHz. 10 banks with 30 channels each are useful for storing similar frequencies to maintain faster scanning cycles or for storing all the frequencies of a trunked system. Smart Scanner - Automatically program your BC245XLT with all the frequencies and trunking talk groups for your local area by accessing the Bearcat national database with your PC. If you do not have a PC simply use an external modem. Turbo Search - Increases the search speed to 300 steps per second when monitoring frequency bands with 5 KHz. steps. 10 Priority Channels - You can assign one priority channel in each bank. Assigning a priority channel allows you to keep track of activity on your most important channels while monitoring other channels for transmissions. Preprogrammed Service (SVC) Search - Allows you to toggle through preprogrammed police, fire/emergency, railroad, aircraft, marine, and weather frequencies. Unique Data Skip - Allows your scanner to skip unwanted data transmissions and reduces unwanted birdies. Memory Backup - If the battery completely discharges or if power is disconnected, the frequencies programmed in your scanner are retained in memory. Manual Channel Access - Go directly to any channel. LCD Back Light - An LCD light remains on for 15 seconds when the back light key is pressed. Autolight - Automatically turns the backlight on when your scanner stops on a transmission. Battery Save - In manual mode, the BC245XLT automatically reduces its power requirements to extend the battery's charge. Attenuator - Reduces the signal strength to help prevent signal overload. The BC245XLT also works as a conventional scanner. Now it's easy to continuously monitor many radio conversations even though the message is switching frequencies. The BC245XLT comes with AC adapter, one rechargeable long life ni-cad battery pack, belt clip, flexible rubber antenna, earphone, RS232C cable, Trunk Tracker frequency guide, owner's manual and one year limited Uniden warranty. Not compatible with AGEIS, ASTRO, ESAS or LTR systems. Hear more action on your radio scanner today. Order on-line at www.usascan.com for quick delivery.



More Radio Products

Save even more on radio scanners when purchased directly from CEI. Your CEI price after instant rebate savings is listed below:

Bearcat 895XLT 300 ch. TrunkTracker I base/mobile scanner.....	\$179.95
Bearcat 780XLT 500 ch. TrunkTracker III base/mobile.....	\$324.95
Bearcat 278CLT 100 ch. AM/FM/SAME WX alert scanner.....	\$159.95
Bearcat 245XLT 300 ch. TrunkTracker II handheld scanner.....	\$189.95
Bearcat 248CLT 50 ch. base AM/FM/weather alert scanner.....	\$89.95
Bearcat Sportcat 200 alpha handheld sports scanner.....	\$169.95
Bearcat Sportcat 180B handheld sports scanner.....	\$149.95
Bearcat 80XLT 50 channel handheld scanner.....	\$99.95
Bearcat 60XLT 30 channel handheld scanner.....	\$74.95
Bearcat BC77 information mobile scanner.....	\$139.95
AOR AR8200 Mark II Wide Band handheld scanner.....	\$539.95
AOR AR16BQ Wide Band scanner with quick charger.....	\$209.95
ICOM ICR8500 wideband communications receiver.....	\$1,469.95
ICOM PCR1000 computer communications receiver.....	\$379.95
ICOM R10 handheld wideband communications receiver.....	\$279.95
Uniden WX100 Weather Alert with S.A.M.E. feature.....	\$49.95

AOR

AOR® AR8200 Mark IIB Radio Scanner

AOR8200 Mark IIB-A wideband handheld scanner/SPECIAL \$539.95

1,000 Channels • 20 banks • 50 Select Scan Channels

PASS channels: 50 per search bank + 50 for VFO search

Frequency step programmable in multiples of 50 Hz.

Size: 2 1/2" Wide x 1 3/8" Deep x 6 1/8" High

Frequency Coverage:

500 KHz to 823.995 MHz, 849.0125-868.995 MHz, 894.0125-2,040.000 MHz.

The AOR AR8200 Mark IIB is the ideal handheld radio scanner for communications professionals. It features all mode receive:

WFM, NFM, SFM (Super Narrow FM), WAM, AM, NAM (wide, standard, narrow AM), USB, LSB & CW. Super narrow FM plus Wide and Narrow AM in addition to the standard modes. The AR8200 also has a versatile multi-function band scope with save trace facility, twin frequency readout with bar signal meter, battery save feature with battery low legend, separate controls for volume and squelch, arrow four way side rocker with separate main tuning dial, configurable keypad beep/illumination and LCD contrast, write protect and keypad lock, programmable scan and search including LINK, FREE, DELAY, AUDIO, LEVEL, MODE, computer socket fitted for control, clone and record, Flash-ROM no battery required memory, true carrier re-insertion in SSB modes, RF preselection of mid VHF bands, Detachable MW bar aerial. Tuning steps are programmable in multiples of 50 Hz in all modes, 8.33 KHz airband step correctly supported, Step-adjust, frequency offset, AFC, Noise limited & attenuator, Wide and Narrow AM in addition to the standard modes. For maximum scanning pleasure, you can add one of the following optional slot cards to this scanner: CT8200 CTCSS squelch & search decoder \$89.95; EM8200 External 4,000 channel backup memory, 160 search banks. \$69.95; RU8200 about 20 seconds chip based recording and playback \$69.95; TE8200 256 step tone eliminator \$59.95. In addition, two leads are available for use with the option socket. CC8200 PC control lead with CD ROM programming software \$109.95; CR8200 tape recording lead \$59.95. Includes 4 1,000 mAh AA ni-cad batteries, charger, cigar lead, whip aerial, MW bar antenna, belt hook, strap and one year limited AOR warranty. Enter your order now at <http://www.usascan.com>.



Buy with Confidence

Order on-line and get big savings

For over 32 years, millions of communications specialists and enthusiasts worldwide have trusted Communications Electronics for their mission critical communications needs. It's easy to order. For fastest delivery, order on-line at www.usascan.com. Mail orders to: Communications Electronics Inc., P.O. Box 1045, Ann Arbor, Michigan 48106 USA. Add \$20.00 per radio transceiver for UPS ground shipping, handling and insurance to the continental USA. Add \$13.00 shipping for all accessories and publications. For Canada, Puerto Rico, Hawaii, Alaska, Guam, P.O. Box or APO/FPO delivery, shipping charges are two times continental US rates. Michigan residents add sales tax. No COD's. Your satisfaction is guaranteed or return item in unused condition in original packaging within 61 days for refund, less shipping, handling and insurance charges. 10% surcharge for net 10 billing to qualified accounts. All sales are subject to availability, acceptance and verification. Prices, terms and specifications are subject to change without notice. We welcome your Discover, Visa, American Express, MasterCard, IMPAC or Eurocard. Call anytime 1-800-USA-SCAN or 800-872-7226 to order toll-free. Call 734-996-8888 if outside Canada or the USA. FAX anytime, dial 734-663-8888. Dealer and international inquiries invited. Order your radio scanners from Communications Electronics Inc. today at www.usascan.com.

For credit card orders call

1-800-USA-SCAN

e-mail: cei@usascan.com

www.usascan.com

PO Box 1045, Ann Arbor, Michigan 48106-1045 USA
For information call 734-996-8888 or FAX 734-663-8888

Price schedule effective March 1, 2001 AD #030101MT © 2001 Communications Electronics Inc.

**COMMUNICATIONS
ELECTRONICS INC.**
Emergency Operations Center

Visit WWW.USASCAN.COM • 1-800-USA-SCAN

Going Mobile

We have, as a society, become very busy people. As such, finding time to enjoy the amateur radio hobby can be difficult. However, one place that has always seemed to be a haven for ham radio is the cockpit of an automobile.

Quite a few years ago, I had a twice weekly commute from New Jersey to Washington, D.C.. I had my trusty Drake TR 33C full of crystals (yes, this was in the days before cheap frequency synthesis) to cover all the major repeaters along Route I-95. I could even do a trick at the top of the Delaware Memorial Bridge where I could hit my home repeater while still about an hour out and run an autopatch phone call to my XYL to let her know I was nearing home station.

Some years later I became involved in county hunting, the process of working hams, usually operating mobile, from every county in the United States. This led to my initial experiments with mobile HF operation. Imagine driving a Honda Civic with a Kenwood TS-520, tube final, rig sitting on the passenger seat. I used to have to rev the engine so the rig wouldn't draw the battery down too much on transmit.

As you can see from the above personal anecdotes (and, believe me, there are dozens more), mobile amateur operation can be a lot of fun. It can also include a number of adventures and challenges that really run the fun meter into the red!

We are moving into a truly golden age for mobile operation. Rigs like my old TS-520 that displaced a passenger are now as small as a traditional, under the dash CB radio. A few years ago the hot setup was a dual

band VHF/UHF rig. Now, the major manufacturers are in a design war producing combined HF/VHF/UHF "One Rig Does It All and Brews Coffee Too" transceivers, again with very small form factors.

So if you are not already "mobilized," it's time to get on the stick. Lets have a little talk about getting things set up for good mobile operating.

◆ The Essence of Car

If you ever are wandering around a new or used car lot, you will always be able to spot the ham buying a car. A ham's needs are a little different from your average car buyer. (It's also fun to use these eccentricities to drive the car sales person around the bend.) For example, when I go looking for a car I pop the hood and look to see if the battery is located close to the firewall as opposed to way up front. If the car has its engine mounted "sidewinder" are the plug wires toward the front or the rear of the engine compartment? I check to see if the firewall appears to have a place or two that will allow bringing wires into the driver's compartment without major surgery.

Once I've gotten initiated under the hood I then check out the outside. I look for sturdy "hard points" on the roof, trunk lid and bumpers for mounting antennas. If I really want to get into things, it doesn't hurt to head for the service department and ask if the particular car in question has had any service bulletins concerning RF interference or mobile phone/radio installation. (Note: one of the few good things to come out of cell phone technology is that cars' microprocessor controls tend to be better shielded than they used

to be.) Every ham from the early eighties knows a story of somebody who put a ham rig in a new car and whenever the mike was keyed the windshield wipers turned on, the horn blew or the car's engine died.

But, most folks reading this aren't going to run out and buy a new car just to play radio. These are considerations you may want to have on your checklist if you do go shopping in the future. And I can tell you from experience that you can get a few extra dollars knocked off because "the bumpers just aren't wide enough for a Hustler Ball Mount." You can make almost any vehicle a suitable mobile platform. Some will just take a little more work than others.

◆ Some Power Basics

Okay, let's review that bit about checking around under the hood. If you want to run a mobile rig your first order of business is to get the best, steadiest, cleanest 13.6 volts (the REAL 12 volts) into your driver's compartment that you can. You want to do this with full consideration for safety and minimum interference from (and to) electrical components under the hood and under the dashboard.

Generally, the best way to go is to run a pair of fused wires from your car battery through the firewall to your transceiver. My practice is to use #12 gauge stranded copper with appropriate fusing in both the hot and ground wires. Always check your radio's manual to determine the current handling requirements you may need and adjust the wire size and fuse ratings accordingly.

So how do you actually connect to the battery?! This has become very easy in re-



The new Kenwood TS-2000 is significantly smaller in size than the TS-520 Old Uncle Skip used to go mobiling with.

cent years. Most automotive supply stores now stock battery cables and cable ends specifically designed with "extra" wire attachment points. These are designed for the "high output" audio crowd but we hams can make good use of them as well. Standard practice is red wire for hot and black for ground side. Don't try to skimp and use a single hot wire and then grab ground from some bare metal inside the car. This tends to lead to interference pickup and can make for some bad business if a short occurs. Stick to *two fused wires!* Protect your rig and your car.

Under the hood, you will want to run the wires so they do not come into contact with any moving parts or run across any hot or abrasive surface. I steer clear of the fuel system as well. Accidental sparks around gasoline could start a fire. An additional consideration is to keep the wires well away from any part of the ignition system or any of a modern car's "black boxes." Remember, these can also be under the dash, so pay a bit of attention there as well.

I usually have good luck tracing wires under the hood to find an existing rubber grommet through the firewall that will usually accommodate an extra couple of hefty wires. If you are not so lucky, before you drill any holes, head for the car/radio store again and buy an appropriate size rubber grommet. Drill a hole to allow for proper placement of the grommet and, by all means, before you drill make sure you will make a clean hole and NOT drill through any wires, parts, fuel lines, etc. (All those things that will make you look really foolish when the tow truck driver arrives, should you goof up *too* badly.)

◆ Connectors

Okay, so now you have these two wires dangling under your dashboard. Now what?

Most folks prefer some sort of quick release wiring system to allow for easy removal of the radio for servicing or as an anti-theft countermeasure. Over the years I have taken up the idea of standardizing my connectors for mobile use. This allows me to plug various radios into my hot connection coming in from the battery. I use "Molex" brand connectors rated at 20 Amps. These cover all the gear I carry mobile and can be found at most parts suppliers. Radio Shack even stocks them under their own name. There are a number of other suitable connectors as well. Take some time to research the possibilities that are best for you and your application.

◆ Rig Placement

This can be trickier than you think. Modern automobile dashes often have rounded surfaces that can be a bit hard to work with. Further, it is important to know what is going on behind those plastic surfaces. Car manufacturers hide all kinds of wires and parts

under the dash. You will also need to find "hard points" to mount the radio. A good place to look is around ashtrays and existing factory installed radios. These areas usually have enough extra metal to do the trick.

Now you also have to give some thought to the process of operating a radio in a car. For example, I like a standard transmission. If I were to mount the rig in the more traditional center console space, I could end up driving down the road wrapping the mike wire around the steering wheel and gear shift if I wasn't careful.

A couple of years ago I came up with a solution that killed two birds with one stone. I mount my primary 2 meter rig on the *left* side of my driving position. This allows me to operate the radio with my left hand and still grab gears with my right. Ever since I took up this system I have never done the embarrassing "steering wheel wrap" since. Further, shady characters don't tend to look for radios on the left side of the car. I toss a piece of an old black T-shirt over the radio and you can't even see it through the windows. Very cheap anti-theft protection.

◆ Antennas

These new multi-multi-multi-multi band radios have created a land office business for mobile antenna systems. A quick trip through any ham radio accessory catalog will yield dozens of possible choices. I've always found performance and gain figures associated with short vertical mobile radiators to be very speculative. There are just too many practical factors to take into account that could adversely affect antenna performance on the road. So when I make my antenna choices, I give a quick passing glance to gain figures in favor of practical design. In other words, I'll sacrifice a decibel or two in favor of a sturdy, well constructed aerial that is going to mount safely on my car's roof, bumper or trunk lid as the case may be. Some people might also throw in general aesthetics as well. Personally, I always thought a distinctive (weird looking) antenna made my car easier to find in a parking lot.

The only other trick to figure out is getting the transmission line from the antenna to the transceiver. Much of what was discussed in the under the hood section still applies. You will want to keep the wire away from other electrical and fuel lines. You will also want to route it so that it doesn't abrade or kink with normal use. A good place to look on many cars is under the plastic pieces at the base of the car doors. This often avoids lifting the carpets which can be tricky on some newer cars.

There is no one right way to set up a mobile installation.. Cars and people differ widely. However, a safe installation used in a safe manner can make for many miles of amateur radio fun.

NOTICE: It is unlawful to buy cellular-capable scanners in the United States made after 1993, or modified for cellular coverage, unless you are an authorized government agency, cellular service provider, or engineering/service company engaged in cellular technology.

Full 800 MHz Scanners



AOR AR-8200 (unblocked)

Wideband Portable receiver

- 0.5 to 2040 MHz continuous.
- NFM, WFM, NAM, WAM, USB, LSB & CW
- Alphanumeric memory identification
- Spectrum scan
- Computer control
- Flexible dynamic memory bank layout
- Optional CTCSS & Extra memory boards

\$699^{us}



ALINCO DJ-X10 (unblocked)

Wideband Portable receiver

- 0.1 to 2000 MHz continuous.
- NFM, WFM, AM, USB, LSB & CW
- Alphanumeric memory identification
- Channel scope
- 1200 memory channels
- Superb sensitivity, Clear sound
- Various scanning modes - Menu system

\$499^{us}



ICOM PCR-100-08

Wideband receiver for PC

- PCR-100 can be used with your Desktop or Portable PC
- 0.1 to 1300 MHz continuous.
- Modes AM, FM & WFM
- Built-in tone squelch
- Multiple screens: multi-function control panel

\$229^{us}

+ OPTOELECTRONICS & YUPITERU

Guaranteed Delivery to USA.

Radioworld

Phone: **(416) 667-1000**

FAX: (416) 667-9995 Website Address: <http://www.radioworld.ca>

sales@radioworld.ca 4335 Steeles Ave. W., Toronto, ON Canada M3N 1V7

GORDON WEST
HAM TEST PREP TAPES
BOOKS SOFTWARE VIDEOS

Prepare for your ham test with "Gordo" WB6NOA as your personal instructor.

- **THE NEW THEORY** on audio cassettes
 - No-Code Technician (4 tapes)..... \$19.95
 - General Class (4 tapes)..... \$19.95
 - Amateur Extra Class (4 tapes)..... \$19.95
- **THE CODE** on audio cassettes
 - Learning CW (0-7wpm 6 tapes)..... \$29.95
 - Speed Builder(5-16wpm 6 tapes)... \$29.95
 - Speed Builder(10-28wpm 6 tapes)...\$29.95
- **NEW STUDY MANUALS** by "Gordo"
 - No-Code Technician (Element 2)..... \$11.95
 - General Class (Element 3)..... \$12.95
 - Extra Class (Element 4)..... \$14.95
- **PC SOFTWARE** with study manuals
 - No-Code Technician (Element 2) \$34.95
 - Tech/Tech+/Gen. (+ Code, Windows) \$49.95
 - General Class (+3+Code, Windows)... \$34.95
 - Extra Class (+4+Code Windows)..... \$34.95
 - Ham Operator (Tech-Extra +Code)..... \$59.95
 - Morse Software Only..... \$12.95
- **VIDEO** VHS with study manual
 - No-Code Tech Video Course..... \$31.95

Add \$4.00 for shipping 1st item, \$1.50 each additional
 Priority Mail 2-3 day service available
 VISA, MasterCard, Discover & AMEX Accepted

W5YI Group

P. O. Box 565101 • Dallas, TX 75356
 Call Toll Free **1-800-669-9594**

Recapping and Testing the Triplett R.F. Generator

Last month, I emphasized the importance of adding a good r.f. generator to your test instrument “arsenal” and made some suggestions about types you might acquire. Then we concentrated on the one I had picked up to discuss on these pages, a Triplett 2432 manufactured just after World War II for the radio service trade. We popped the front panel, removed the power supply module, and took off the several copper shield covers that were surrounding the other modules making up the unit. I was surprised and pleased by the quality and ruggedness of the construction.

As I always do, I checked out the power transformer early in the game (with the rectifier tube removed to prevent plate and screen voltage from being applied to the circuitry). Transformers can be tough to replace and it's better not to put in a lot of work on a radio or other piece of equipment until you are sure you have a good one! The transformer passed muster, and an inspection of the other circuitry revealed that the unit was clean and free of owner modifications. During that preliminary look, I also discussed the location and function of the main circuit elements.

◆ Circuit Review

At the time, I didn't have a schematic of the circuit to show you. But I've since been able to acquire an owner's manual for the 2432, so I'm

reproducing the schematic now for your review. The dotted line represents shielding – either as braid that covers wires or as sheet copper enclosing entire circuit modules. At the upper left of the schematic, you'll see the 6SJ7 tube that does the r.f. generating.

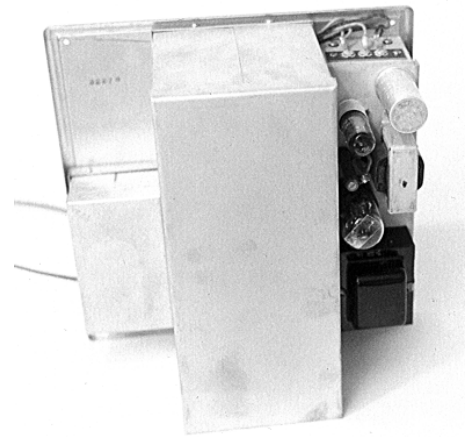
Notice the shielded cable running across the top of the schematic, carrying the r.f. output from the plate of the tube to a shielded enclosure containing a resistor network. The network allows adjustment of the strength of the r.f. signal appearing at output jack J1. The coils and capacitors just to the right of the tube are the tuned circuits that – along with main tuning capacitor C7 – control the generator frequency.

The fixed-frequency audio generator, using a 6J5 tube, is at the lower left. The audio can be impressed on the r.f. carrier, when that is helpful in radio alignment procedures. Or, it is available directly at output jack J2 for use in tracing audio circuits. Finally, the power supply is at lower right. Note the 6X5 rectifier and the OD3/VR150 voltage regulator tube. The latter provides a steady power supply output (at 150 volts) that contributes to a stable output signal.

◆ Cleaning and Recapping

This month's work session began with a

spray of contact cleaner on the working parts of all selector switches and controls – including the sliding contacts that change the coil/capacitor combinations as the main bandswitch is rotated. Then, as is my practice, I methodically replaced the paper capacitors in the unit. Unfortunately, because of the tight wiring interconnecting the various subchassis in the unit, I wasn't able to get at two of them – at least not without serious dismantling. But I was able to verify that these two caps showed no leakage whatever even on the highest ohm range (30 megs) on my VOM.



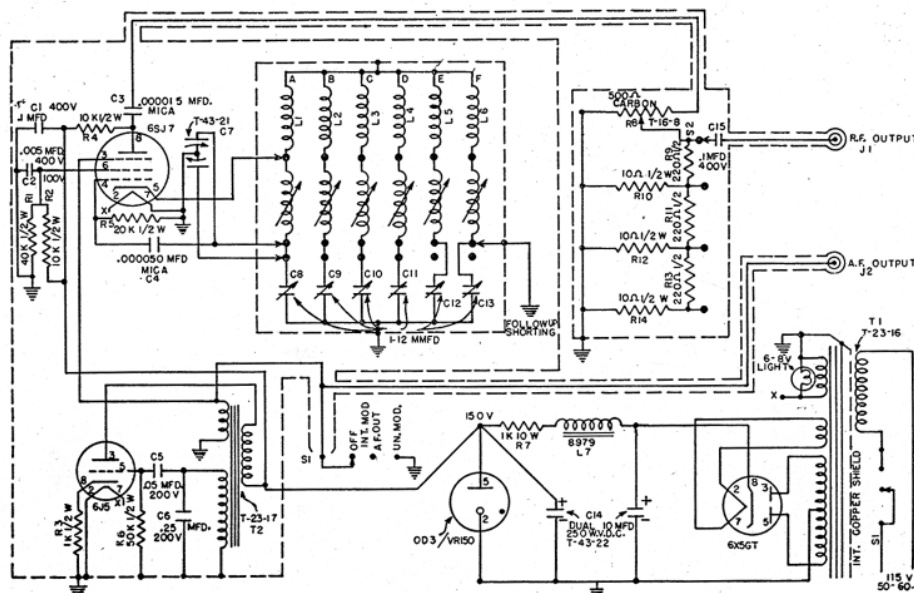
Once the 2432 is buttoned up again, there isn't much to see. The extensive shielding covers everything but the power supply.

I also replaced the two electrolytic caps in the power supply module. During all of this, I definitely made good use of the butt-connector replacement technique that I outlined in last month's column. Of course, the specialized caps in the tuned circuits (C8-C13) were not touched. They are not a type that is subject to deterioration and leakage, and disturbing them in any way would affect the calibration of the unit.

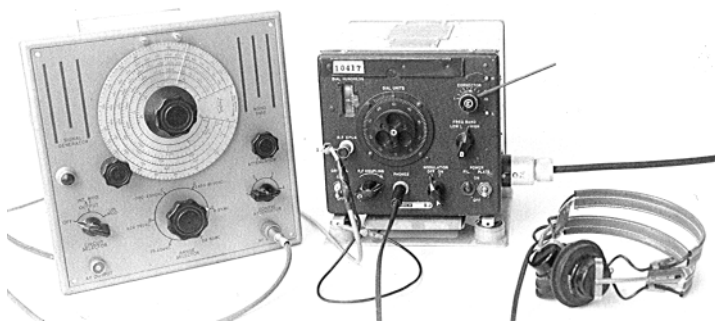
While I had the subchassis units separated, I took advantage of the opportunity to check the values of all the carbon resistors. These do have a habit of drifting (usually increasing) with age, particularly the higher resistance ones. However I didn't observe any of that here. All resistors were silver band (10%) tolerance units and the exhibited values were within this tolerance or not far enough outside to worry about.

◆ Button-Up and Testing

Now it was time to reinstall the power sup-



Triplett 2432 Schematic shows the unit's thorough shielding and simple design.



The 2432 hooked up the Navy "LM" for testing. Headset allows signal from the 2432 to be adjusted to "zero beat" with signal of precise frequency generated internally in "LM."

ply unit and all the shield cans, button everything up, and turn the unit on. In case you hadn't noticed, this is the first time I've applied power since I first purchased the instrument at the flea market. I resist the temptation to turn a set on until I've had a chance to check it over thoroughly and replace all caps. One leaky or shorted capacitor (a distinct possibility in a long-disused instrument) can burn up a power transformer, i.f. transformer, speaker field, or other hard-to-find component.

As a precaution, I hooked up my VOM to measure power supply d.c. output. If it failed to come up to the specified 150 volts in a reasonable time after switching on, I was ready to cut the power. However, nothing of the sort happened. The voltage came up properly and held steady.

I first connected the Triplett's output to the antenna terminal of an old Hallicrafters S-40 communications receiver that I keep on the bench. The S-40's frequency range would not hit the lowest band on the 2432 (75 to 22 kHz), but covered one or more suitable test frequencies on all the other bands. I listened to a signal from the high end and the low end of the dial on each band—except for the 225 to 750 kHz range, where I could only hit the high end. The signal everywhere was strong, steady and clear, both in unmodulated and modulated mode. And furthermore (though the dial calibration on the S-40 has never been checked) I picked it up at about the right place on the dial each time.

For a more rigorous calibration test, I brought out my old, but highly accurate, World War II surplus Navy "LM" Frequency meter. Some of you may know this instrument better as the very similar Army BC-221. This unit has provision for accepting an exterior signal (as from the generator under test) and comparing it with an accurately calibrated internally generated signal.

Using the "LM," I spot-checked frequencies at different points on all of the 2432's bands except the top one. Its 25 MHz to 50MHz range was outside the reach of the "LM," which cuts off at 20 MHz. In all cases I found the dial setting of the Triplett instrument to be accurate to a very reasonable tolerance, and felt there was no reason to go into the manufacturer's calibration procedure.

I wasn't surprised at how well the tests went, considering the quality construction of this unit.

The Triplett will definitely find a home on my workbench shelf. Up to now (and for years) I've used my "LM" as a service signal generator. But the 2432 is so much faster and easier to set up that from now on the "LM" will be employed only as a

standard for checking the calibration of other instruments.

◆ Reader Input

Among the e-mails received recently from readers are a few that relate to our present projects. In the January column, I recommended Radio Shack as a source of those butt connectors that make small component replacement so easy and neat. However, I hoped that somebody might come up with a more economical source.

Mark (Steubenville, OH) e-mails that Hosfelt Electronics (2700 Sunset Blvd, Steubenville, OH 43952-1158) sells a package of 50 that take AWG 22-16 for \$2.50 or a package of 100 for \$4.50. The part number of this connector is 74-292; larger sizes are also available. Compare to Radio Shack's \$1.49 for 10 each of 22-18 and 14-16 sizes (Cat. No. 64-3036A). Though there will be a shipping charge from Hosfelt, it is nice to be able to purchase in larger quantities and without buying the less desirable larger size.

Mark didn't mention whether the company requires a minimum order. Call Hosfelt at 1-800-524-6464 or 1-888-264-6464 (or fax them at 1-600-524-5414) and ask for a catalogue. Thanks Mark!

This also seems to be a good time to mention an e-mail note I received from reader L.F. Atkinson. He feels that every serious radio restorer should equip himself with a 0-130 volt Variac (or similar) autotransformer feeding an isolation transformer. Of course I've already harped on the great importance from a safety point of view of having an isolation transformer on your bench. With the Variac you can also bring the line voltage up very slowly on a radio you are powering for the first time in your shop.

The gradual powering up of a long-disused (or otherwise questionable) piece of electronic equipment has two benefits: first, you can spot any trouble that might develop (wisps of smoke, etc.) while line voltage is still safely low. Second, the electrolytic caps in the power supply can sometimes be rejuvenated by the slow buildup of voltage. The chemical insulating film that separates the "plates" of an old capacitor may be thinned out, but can be reformed through a slow volt-

age increase as long as that cap isn't dried out inside. If full line voltage were to be applied immediately, an otherwise savable cap could be destroyed instantly.

When I first started writing restoration articles, I was very high on the slow startup method. And I still think it is a good idea to have a Variac in the shop. In fact, I'm putting together a very nice startup unit along the lines suggested by our reader. It's been on the back burner for a long time, but I'll share it with you when it is done. However, I've come to feel that any radio worth working on is worth recapping. And, since capacitors are still easily available (at least by mail) and inexpensive, I change out all paper and electrolytic caps before applying any power.

Reader Nick Terrence was way ahead of us. In an e-mail received some months ago, he inquired if his Powerstat would also serve as an isolation transformer. Regretfully, the answer is no: the primary and secondary of an autotransformer are not isolated from each other; its output terminals are effectively hard-wired to the a.c. line.

JOIN THE AWA

Antique Wireless Association

The original and largest historical radio-collector group

- Publishes *The Old Timer's Bulletin*, Marc Ellis, Editor, with:
 - Battery and AC receiver restoration
 - Vacuum-tube history and collecting
 - Old-time amateur-radio contests
 - Communications receivers
 - Free want-sell-swap ads
 - Early television
 - Horn loudspeakers
 - News of U.S. and foreign clubs
 - Produces the famous annual Rochester meet
 - Maintains unique radio-TV museum
- Membership is only \$15 per year (\$27 for two years, \$18 per year for overseas). Mail check to:

Antique Wireless Association, Inc. • Box E, Dept. 2
Breesport, NY 14816 <http://www.antiquewireless.org>



- * 5.3ft solid 6-panel C/Ku dish, polar mount, add Hq18 and scan 120 azimuth. \$150 + \$80SH (Ku holder \$25 extra)
 - * 4.5ft solid 6-panel C/Ku dish, patio mount, fixed satellite. \$130 + \$60SH (Ku LNB 23mm holder \$25 extra)
 - * Digital C-LNB 20 deg NF + scalar ring, \$69 + \$10SH
 - * Superjack 18" actuator for 5.3ft, HQ18, \$59 + \$20SH
 - * AP3000 Positioner, memory, remote, \$89 + \$15SH
- Email: support@smaller.com or fax 888-7311834



**FREE
SAMPLE
COPY!**

ANTIQUE RADIO CLASSIFIED

*Antique Radio's Largest-Circulation
Monthly Magazine*

Articles - Classifieds - Ads for Parts & Services
Also: Early TV, Ham Equip., Books,
Telegraph, 40's & 50's Radios & more...
Free 20-word ad each month. Don't miss out!

1-Year: \$39.95 (\$57.95 by 1st Class)
6-Month Trial - \$19.95. Foreign - Write.
A.R.C., P.O. Box 802-P14, Carlisle, MA 01741
Phone: (978) 371-0512; Fax: (978) 371-7129
Web: www.antiqueradio.com

Antennas Across the Radio Spectrum Part One: The VLF and LF Bands

For most antenna designs the length of the radio waves to be received or transmitted is generally the main factor used to determine the length of the antenna's elements, and of the spacing between those elements. And, as you probably know, the higher the frequency the shorter the wavelength. Thus we see antennas in the VHF, UHF, and microwave bands with elements and spacing quite small as compared to antennas designed for the HF or lower band frequencies. As an extreme example we can find on the LF and VLF bands antennas with element lengths which are measured in miles or kilometers!

This month we start a three-part series which will discuss various antenna designs used for wavelengths from the VLF (3 to 30 kHz) and LF (30 to 300 kHz) bands; next month we'll cover antennas into MF (300 to 3000 kHz) and HF (3 to 30 MHz) bands; and the month after that we'll move on into the VHF (30 to 300 MHz), UHF (300 to 3000 MHz) and microwave (1 GHz and up) regions.

It is of interest to note that some of the

frequencies of the VLF band overlap part of the range of human hearing (20-20,000 Hz, which is .02 to 20 kHz). In other words, some VLF signals would be audible if they were sound waves rather than radio waves! In fact any alternating current, no matter how low its frequency, is capable of producing electromagnetic radiation (radio waves) in an antenna. Thus there are actually radio frequencies below the range of human hearing, and these lower frequencies can be, and are, utilized for radio communications.

Above the microwave frequencies, electromagnetic radiation occurs as heat, light, x-rays, gamma rays, and cosmic rays. Although there is some similarity in the ways these waves and radio waves behave, we don't utilize radio antenna designs for their radiation or reception.

◆ Wave Propagation and Antenna Design

On the bands we deal with this month we find a variety of radio communication services including foreign broadcasts, aeronau-

tical beacons, maritime radio-location systems, a license-free experimenters band, and maritime communications. With the advent of satellite communication some of these services have become less important.

These frequencies have such long wavelengths that, generally speaking, practical antennas for these bands cannot launch their waves at a distance far enough above the earth to prevent their horizontally-polarized components from being short-circuited into the ground relatively near the antenna. Thus we find that practical antenna designs for these frequencies are vertically polarized. In practical terms this means that the antenna elements responsible for radiating energy are oriented vertically rather than horizontally. Usually these antennas are single radiator, nondirectional designs.

The vertical polarization utilized on these bands can support communication to nearby stations or to any spot on the earth if enough power is utilized in transmitting the signals. In military applications this power is sometimes in the megawatt range. These signals

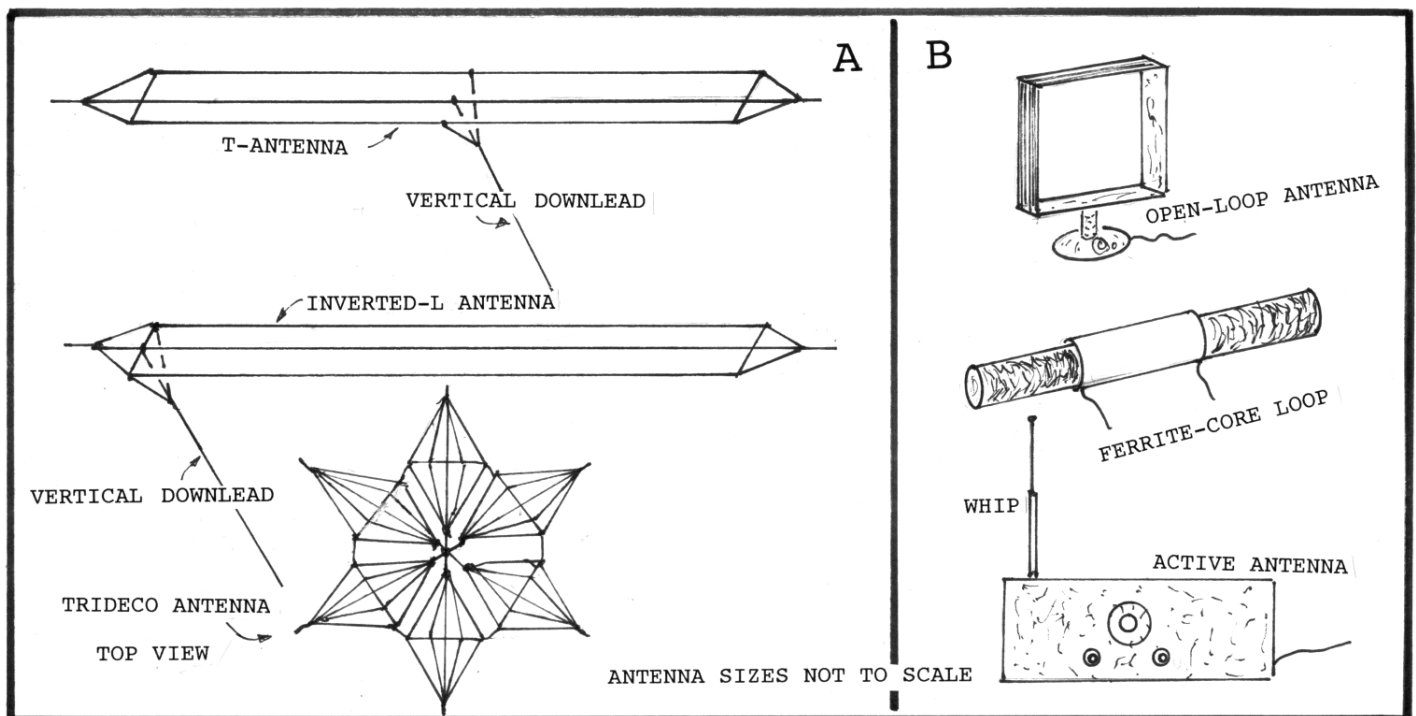


Fig. 1. Some common LF and VLF transmitting antennas (A), and some common LF and VLF receiving antennas (B).

This Month's Interesting Antenna-Related

Web site:

<http://www.softcom.net/users/kd6dks/antenna.html>

If you know things like your antenna's feedline loss, gain, and VSWR, this site will tell you things like the actual power into your antenna and the power lost in your feedline. The information on this site is a legacy from Joseph J. Carr, K4IPV, one of the most productive technical writers radio and electronics has known. He is missed by many.

Send in your suggestions for inclusion here as an interesting antenna-related web site to: clemsmall@hotmail.com.

tend to follow the earth's curvature and stay as ground waves rather than becoming sky waves as in the HF band. Thus they can provide worldwide communication at any time of day or night, in any season.

◆ Transmitting Antennas for LF and VLF

Transmitting antennas for these bands routinely require a lot of space – often measured in miles. With such long wavelengths some form of electrical loading is needed to compensate for the fact that it is usually impractical to make the antenna large enough to be very efficient. Capacitive loading in the form of either a grid of straight wires or a somewhat umbrella-shaped configuration of wires at the antenna's top are common. This top loading is found in representative designs such as the tridco, the T, or inverted-L antennas (fig. 1A).

High-Q inductors are often utilized to allow these short antennas to resonate. These inductors are typically protected from the weather in small enclosures called "the doghouse." When the Q of the antenna system excessively restricts the antenna's bandwidth, automatic bandwidth adjustments may be possible by the use of automated saturable reactors.

◆ Receiving Antennas for LF and VLF

As described by the rule of reciprocity, an antenna which performs for transmitting can also be utilized for reception, and vice versa. Nevertheless, we frequently find separate receive-only antennas used for reception at these frequencies. Generally the receiving antenna is a very great deal smaller than the transmitting antenna.

Small antennas are practical because at these lower frequencies received noise is dominant over receiver-generated noise. As long as the antenna element is long enough to receive a usable level of the desired signal, the signal-to-noise ratio (rather than the

amount of signal received) determines quality of reception. Larger antennas which would capture more signal would also capture more noise, and the signal-to-noise ratio would remain essentially the same.

Commonly utilized receiving antenna designs at these lower frequencies are the air-wound, or box loops, ferrite loops, and active antennas with either a short wire element, or a short whip element (fig. 1B). Random-length, long-wire antennas are also utilized.

If the antenna is resonant, its tuning effect can assist the receiver's tuning in limiting the amount of received noise. Loops can generally be tuned to resonate with the desired signal, and they also have nulls in their reception pattern which can reduce noise and interference from specific directions.

The height above ground of the receiving antenna at these frequencies is not usually important, unlike at higher frequencies.

◆ And So

To sum up, transmitting antennas at LF and lower frequencies are usually very large to gigantic, nondirectional affairs, utilizing primarily vertical polarization. Receiving antennas are much smaller, and sometimes allow some directionality via nulls in their reception patterns.

◆ Antenna Contest Coming Up!

Watch this column in upcoming issues of *Monitoring Times* for announcements of a contest held to find the most unusual antennas in existence! Keep your eyes peeled and your brain alert for antennas that are quite different from the ordinary antennas we see every day in the cities and countryside. We'll have rules and information on entering this contest with your choice for the world's most unusual antenna. We'll report the winner and runner-ups in a future column, and there will be a prize for the winning entry!



Last Month:

I said: "OK, so we've worried about radio horizon, radio ground, radiovision, radionics, and radiotrician. Now just what is "radio" anyhow? The answer may not be as simple as you think."

Well, radio as we use it in radio communications is usually thought of as a transmitter sending signals to a receiver where the signal contains some information such as voice, music, video, or digitized data. But less commonly thought-of radio signals include radar signals, ionospheric sounding signals used to determine the state of the ionosphere, and

natural radio signals such as the noisy interference from static or spheric signals transmitted when lightning occurs, whistlers and dawn-chorus signals listened to by the lowfers, and cosmic radiation coming from outer space to be received by the radio telescopes of radio astronomers. Radio has many faces.

This Month:

Enough of this play on the term "radio" OK? Now tell me who invented radio? Hint: This may be a trick question!

You'll find an answer for this month's riddle, another interesting, antenna-related web site, and much more, in next month's issue of *Monitoring Times*. 'Til then Peace, DX, and 73.

Longwave Resources

✓ **Sounds of Longwave** 60-minute Audio Cassette featuring WWVB, Omega, Whistlers, Beacons, European Broadcasters, and more! \$11.95 postpaid

✓ **The BeaconFinder** A 65-page guide listing Frequency, ID and Location for hundreds of LF beacons and utility stations. Covers 0-530 kHz. \$11.95 postpaid

Kevin Carey
P.O. Box 56, W. Bloomfield, NY 14585

Antenna Designer

New Version 2.1 for Microsoft Windows 95 and 98

Computer program helps you design and build 17 different antennas from common materials. Based on Antenna Handbook by W. Clem Small.

Only \$39.95

\$5 S/H on all orders
CA residents add 8.5%
Shipped on CD ROM

Send check or money order to:

Small Planet Systems
623 Mangels Avenue
San Francisco, CA 94127

www.smallplanetsystems.com 415-337-9394

Kiwa Pocket Loop

TM

The Kiwa Pocket Loop is a 12.5 inch diameter Air Core Loop Antenna that collapses to fit in your pocket! This antenna is designed for portable receivers to enhance MW and SW reception. Tuning is from 530 kHz to 23 MHz using a battery powered low noise amplifier. No direct connection to the receiver is required. The special coupler is simply slipped over the whip antenna for improved reception.

The Kiwa Pocket Loop is the ideal travel companion for those who require a loop antenna for on the go!

Kiwa Electronics

612 South 14th Ave., Yakima WA 98902

☎ 509-453-5492 or 1-800-398-1146 (orders)

✉ kiwa@wolfe.net (Internet/full catalog)
www.kiwa.com

In 2001, Voice Command for Your Receivers

You know ... each month when I finish a column I *think* I know the next month's topic. But, in high-tech products thirty days is a *long* time. Yup. It happened again this month. Instead of looking at real-life aviation as planned, we are going apply software from the flight simulation and gaming world to our real-life monitoring.

❖ Computers & Flying

My interest in flight simulators stems from my boyhood and my father's stories of flying the Boeing B-29 Superfortress. Twenty-seven years ago I earned my pilot's license, and it has been in my blood ever since. I dragged my family all over the country in 1979 looking for the first flight simulators for the Apple II. They were very basic and took a lot of imagination.

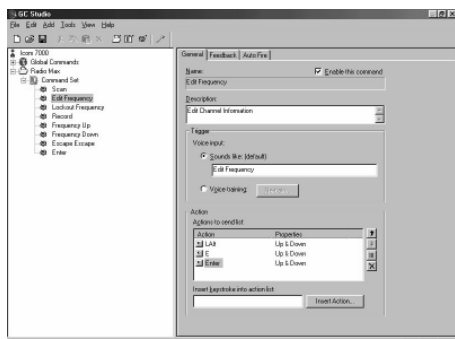


Figure 1 – Game Commander's Command Setup Screen

These days flying a Pentium computer is all the left seat time I get. But, programs such as Jane's F/A-18 Hornet, Combat Flight Simulator and Microsoft's Flight Simulator 2000 are pretty darn real. Weapon systems, avionics and detailed navigation make flying these things very complex. At times, the key-pushing becomes intense.

In an effort to reduce the computer pilot's workload some companies have developed voice recognition command systems. Game Commander 2, by Mindmaker, is a totally software-based voice command system.

❖ Healthy Skepticism

Now just wait a minute. I was as skepti-

cal as you are. I remember a bitter childhood memory when I waited hundreds of years (ok, it was just five weeks, but it felt like years when you're ten years old) for a Lionel Train Commander. The picture on the box showed an engineer speaking into a "microphone." The box promised voice control of your trains. Instead what I got on Christmas morning was a spring loaded diaphragm switch in the form of a microphone. When you spoke into it LOUDLY, your breath pushed open the switch. What a rip! But forty years makes a huge difference, and *this* Game Commander is for real!

While using Game Commander 2 and doing a roll on take-off in an F/A-18 fighter, I called out "landing gear up ... retract flaps...full throttle." Almost magically, I watched as the aircraft's instruments indicated that these commands had been understood and performed. Then I thought, "Why not Scan ... Edit Frequency and Lockout Frequency?" Could Game Commander be used for voice control of radios?!

❖ What is Game Commander?

The Game Commander recognizes voice commands and translates them into key presses. Game Commander 2 comes on a CD-ROM and requires a Pentium computer with a duplex sound card, running Windows 95, 98 or 2000. A microphone is included with the retail version. That's it. Nothing fancy by today's standards. But Pentiums come in different "sizes." Although I run flight simulators on a 500 MHz Pentium Celeron, my receivers are controlled via a 233 MHz Pentium I.

Installation of the Game Commander could not be easier or quicker. Within two minutes I was ready to try it on the slower 233 MHz computer. A head microphone is provided with the retail version of the program. However, for our application I first used a very inexpensive computer desk microphone that I bought at a flea market for \$2.00. It worked quite well so I then connected the microphone which is internal to my monitor. This worked just as good, while reducing desk clutter.

One thing that really surprised me was that no voice training of the Game Com-

mander is required. Other voice recognition word processing programs I have used in the past (without much success) require a voice training session where the user reads fifteen minutes of Arthur C. Clark's 2010. Although there is a voice training feature on Game Commander, I have not needed to use it. Let's try to control an ICOM R7000 using Game Commander 2 and RadioMax version 5.17.

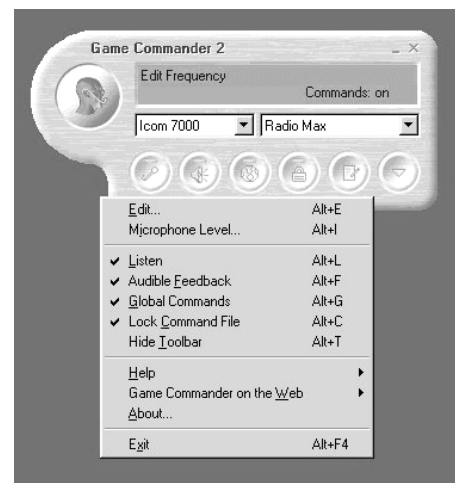


Figure 2 – Game Commander's Control Box.

❖ The Real Deal or Lionel?

Figure 1 displays the screen used to define voice commands and associated key presses. Here you can see the "Edit Frequency" command. The "sound like" box is where we have typed in the words that we will speak to make the program press the right keys.

In the lower box, labeled "Actions to send list" I have pressed the RadioMax keystrokes to open the Edit Frequency command: Alt, E and Enter. The user can program up to 256 keystrokes per command. In a similar manner I have set up Scan, Lockout Frequency, Frequency Up, Frequency Down, and a few other commands. Now we are ready to try Game Commander with RadioMax.

First we need to start Game Commander and select the RadioMax command file. See Figure 2. Then we can start RadioMax. Everything looks and acts as it does without

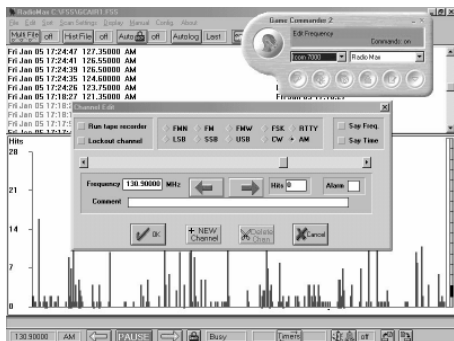


Figure 3 – Working with RadioMax – “Dave ...What Frequency Do You Wish?”

Game Commander. But as soon as we speak the words “Edit Frequency,” RadioMax’s screen goes to the Edit Channel screen seen in Figure 3. Pretty nifty. Bye-bye bad Lionel flashbacks.

◆ Lazy Technology

I often have my scanner running in my office while I am doing a million other things. It never fails. When I am across the room, with my hands full, something very interesting breaks the searching scanner’s squelch. But before I can drop what I am working on, charge across the room and hit the stop scan button, the scanner moves off the channel. Goodbye hot catch!

Well, not anymore. With Game Commander all I have to do is to say “Scan.” I have set up the program to toggle the radio between Scan and Pause. Similarly, when the receiver is in the search mode and the scan stops on a source of constant interference, a call of “Lockout Frequency” does the job. Using RadioMax, the frequency with interference is marked for skipping and the search continues. All without me leaving my chair across the room!

◆ Why Not “Channel”?

Some care must be taken in order to make the voice command method work. The distance between the microphone and the receiver’s speaker should be maximized. The radio’s volume should be kept to a minimum so it does not drown out the voice command.

I also found that the choice of command words make a big difference. When I first set up the command, I used “Channel” for the Edit Channel command. Well, after the edit screen appeared without warning a number of times, I realized the problem. When a station stops transmitting, the squelch tail sometimes makes a “Shuuunel” noise, which sounds too much like “Chuuunnel.” Using two word commands also reduces the chances of false commands.

Since Game Commander works on key-

strokes, it will not work with point-and-click commands. However, many programs have keystrokes or menu line commands as alternatives to point-and-clicks. Also to maximize command response, on slow computers keep programs running in the background to a minimum.

◆ Is It Really Usable?

In a word...YES! The scan toggle and lockout voice commands make scanning while working on other projects a very productive and enjoyable experience. Check out Game Commander at <http://www.gamecommander.com>. A free trial downloadable version of Game Commander 2 is available at the site. The full version is downloadable for \$29.95. The retail version, including a head microphone, is available for \$39.95.

Over the next few weeks I’ll try Game Commander on other receivers and control programs. If the results are as good as with RadioMax we’ll share them with you. Game Commander works great with a trusty old 233 MHz Pentium running RadioMax and a R7000. It’s like having HAL from 2001, A Space Odyssey, in your shack controlling your receivers.

“Thank you, Dave ... I mean John.”



Uniden BC780XLT

IT WAS WORTH THE WAIT...

THE ALL-NEW UNIDEN BC780XLT TRUNKTRACKER III!

This next-generation scanner is an astounding step forward! Follow conventional communications, or any of the three leading trunking technologies Motorola, GE Ericsson EDACS, or Johnson Letter simultaneously! Up to 500 channels and 10 priority frequencies may be stored in 10 memory banks. And if you don't know your local frequencies, simply use a computer and modem to dial Uniden's 900 telephone number, and SmartScanner technology will do the rest!

Other features include the life-saving S.A.M.E. weather alert function, alphanumeric display, continuous 25-1300 MHz frequency coverage (less cellular), 10 factory-preprogrammed service searches, brilliantly backlit LCD, fully backlit keys, AM/FM/WFM reception modes, base or mobile configuration, computer control, CTCSS/DCS squelch systems, and more!

Yes, the BC780XLT is the scanner we've all been asking for, and you can order it now from Grove Enterprises!



NOW IN STOCK!

ORDER SCN49
for only \$349.95

plus \$7.95 shipping in the U.S.

Grove Enterprises, Inc.

800-438-8155

7540 Highway 64 West

Brasstown, NC 28902

828-837-9200 828-837-2216 (fax)

order@grove-ent.com

**CALL
NOW!**

www.grove-ent.com

Mr. Kloss's Perfect Radio: The Henry Kloss Model One

The last time you saw the name Henry Kloss in this magazine was my review of the Kloss Model 88 AM/FM radio (MT July '99). At the end of the review I made a few minor comments about the fact that this superb radio, with its digital tuning, remote control, excellent stereo separation and unparalleled audio, could have used a few more station presets and a clock. I happen to enjoy waking up to beautiful music and it was inconvenient not to be able to do so.

Mr. Kloss now introduces a new radio and what do you think he's done? First, he threw out the other speaker. Who cares about stereo anyway when the speakers are less than six inches apart? Next, he threw out the digital tuning, the digital display and the station presets. Then, he got rid of the bass control. Heck, he even dispensed with the remote control! So, here's what you get with the new Kloss Model One: a smaller, monaural, analog tuned, AM/FM radio with the kind of rich audio fidelity you'd hope to find in a stereo system costing four times the Model One's hundred dollar price tag.

◆ Visionary's journey

Kloss got his start as an MIT student in the early '50s at the dawn of the modern

broadcast FM radio era. Tinkering with speaker designs and hobnobbing with FM pioneer Edwin Armstrong, Kloss was on a life long journey to perfect FM radio reception. Along the winding road Kloss left a trail of glittering consumer electronics products and the companies that made them, all still revered by audiophiles everywhere. KLH, Acoustic Research, and Advent are among the companies he founded, their storied lines of products evoking fond memories for anyone who has ever sought audio perfection.

The Kloss Model 88, intended as an update on his classic Model 8 from the early '60s, was done with his previous company Cambridge Sound Works. The Model 88 stands as the definitive answer to the Bose Wave radio. Still, Kloss was on his acoustic quest and a few years ago joined Tom DeVesto, former CEO and Head of Research and Development at Cambridge Sound Works who by now had formed Tivoli Audio, for the purpose of promoting Kloss's latest work.

Kloss, clearly a radio listener at heart, sought to build a real listener's radio. Stripped of unnecessary accouterments of contemporary electronic fad, Kloss built a radio to make listening a pleasure. With

The legendary Henry Kloss, an electrical engineering visionary wandering through the last half of the 20th century trailing a glittering string of hi-fi/stereo companies and products unequaled in their performance.
(Courtesy Tivoli Audio)

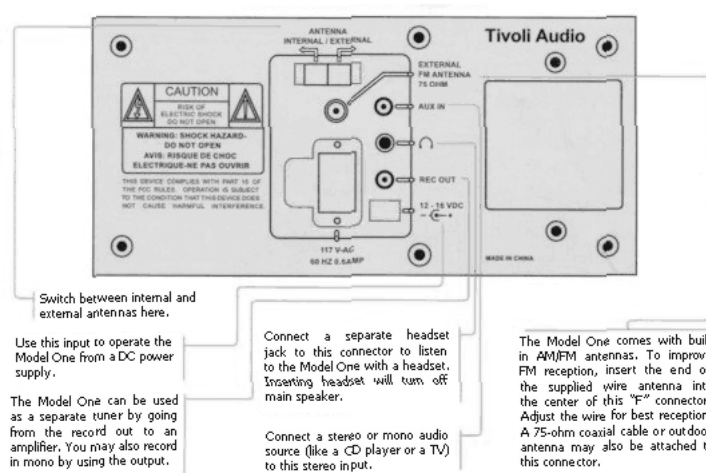
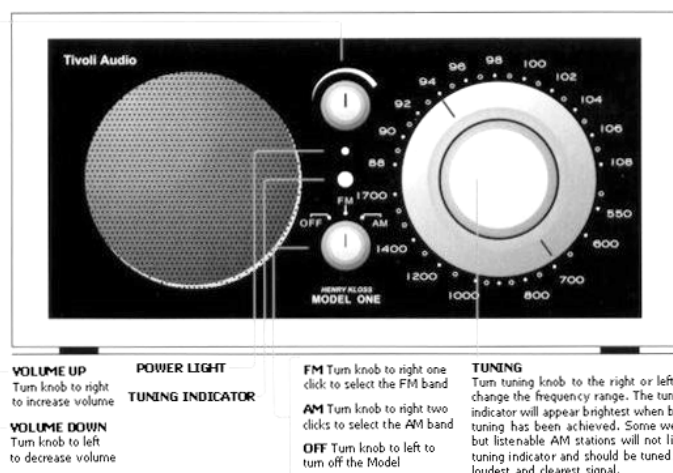


big audio, a small footprint, simple tuning and inexpensive price tag, he believes he got it right. And, he did.

◆ Performance particulars

The first thing you'll notice when you pull this radio from its box is the unusual weight for a table radio this small. Measuring just 4-1/2" high, less than 8-1/2" wide and 5-1/4" deep, it weighs just over 4 pounds. Its heft can be attributed to the massive magnet on its diminutive 2-3/4" speaker, a considerable heat sink for its more than capable amplifier, and its beautifully finished wood veneer cabinet.

The front panel layout features a heart warming retro '60s look with the speaker on the left and the tuning knob on the right, both equally centered. In between are the only other controls: an On/Off/AM/FM switch at the



Front panel. Elegant simplicity of the symmetrical design on the Henry Kloss Model One is stunning. Features include old fashioned analog tuning, a genuine vernier dial and only two controls: an on/off/AM/FM switch and an actual volume control knob (You remember how to work those, don't you?). (Courtesy Tivoli Audio)

Rear panel. So little space, so many features. You can do it all from the back: 12v input for RVers and boaters; Rec Out for taping or using the tuner with a bigger amplifier; mini headphone jack; Aux In for adding a personal CD player, external FM antenna jack; and internal/ external antenna switch. (Courtesy Tivoli Audio)

bottom and a volume control on the top. Two small LEDs are placed between the two knobs: one a green power light and the other a golden tuning indicator which glows brighter as the station's signal strength is increased while tuning.

This latter is another welcome throwback to tuners of old. Even those too young to remember what it was like to tune an analog tuner will appreciate the quality of the Model One's big tuning knob. To complete the retro-look the FM band is tuned with the top of the dial and the AM at the bottom.

◆ Our test

To test this radio I first spend several hours late one evening wandering around the AM band. While the Model One is not billed as a DX radio, I found the tuning a particular advantage for AM DXing. The tight control and deft feel of the 5:1 geared vernier tuning knob made it possible to tune strong signals just 10 kHz apart such as Canada's CKLW and New York's WGY. I quickly logged the venerable old three letter call signs WOR, WLW, WSM, WJR, WSB, WGY, and WBZ. No fewer than seven stations from New York City were heard. This was all done with only the Model One's built-in AM antenna.

But, what really made AM listening a pleasure was the audio treatment these old-timers got from the Model One. Anyone who's ever listened to the modern AM band with a vintage '30s or '40s AM radio always remarks about the depth and wide range response of those old electromagnetic speakers and tube driven amplifiers. The sound is truly duplicated on the AM band with this radio. Chalk another one up for Mr. Kloss.

The next day I put the unit to the FM test. With the built-in antenna the receiver performed as expected. This radio comes with a thin 50" wire with a 75 ohm plug attached which is plugged into the FM antenna jack on the back. Throwing the switch on the back from internal to external the unit performed well tuning in FM powerhouse stations within a 60-90 mile radius. Hooked up to the stacked FM yagi array on the roof the Model One performed as well as the digitally agile Bose Wave bringing in stations as far as 140 miles and just .2 MHz away from other big FM broadcasters.

Finally, I plugged a portable CD player into the jack on the back of the Model One and played a series of CDs ranging from classical to jazz and rock to mariachi. This little gem filled a 20' x 20' room at full volume without distortion in either the crystalline highs or the amazingly low bass. One of the secrets to its bass success is a tuned bass port which is open at the bottom of the radio. This hard working speaker was pulsing air out of that bass port which could be felt by hand six

inches away.

While it's intriguing to have a high performance sound coming out of a radio this small, it's the size of this radio which makes it extremely practical. You can squeeze it into virtually any space. It's perfect for dorm rooms, small apartments, kitchen shelves, study shelves, living room tables, as a speaker for your computer, in your RV or aboard your yacht.

◆ One last thing

The Model One has one more feature which has nothing to do with performance but everything to do with design. It's available in three color combinations. A cherry wood cabinet is matched with a cobalt blue front panel; the maple cabinet features a hunter green front and the classic walnut cabinet is matched with a beige front panel. It's the kind of finishing touch a master gives his finished work and it's among the features which makes this radio a real collector's item.

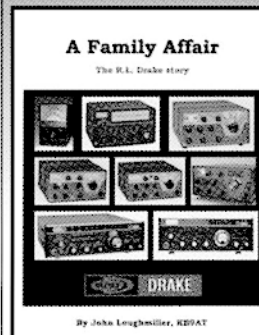
I can't find anything bad to say about this radio. I like monaural audio. I love tuning knobs. It's wonderful to have all this amazing sound pouring out of this sweet little radio. I do wish it were made in America (it's made in China). But, that's why it costs so little.

After thoroughly enjoying playing with this radio, I'm forced to speculate on Henry Kloss's next move. My guess is he's working right now on a super hi-fi crystal set. I hope I'm right!

◆ To Find Out More

The Kloss Model One retails for \$100 and is available from dozens of high-end hi-fi stores around the country. To find the one nearest you go to the Tivoli Audio web site (<http://www.tivoliaudio.com>) and check their dealer list. Many states are unserved with many others having only one or two stores; however, you can buy direct from Tivoli Audio at their web site or by calling 877-297-9479, or by mail at Tivoli Audio, LLC, One Broadway, Cambridge, MA 02142. The Model One comes with a 30 day unconditional guarantee and a one year parts and labor warranty.

A Family Affair The R.L. Drake Story



- Brand new!
- Printed October 2000
- 23 Chapters
- 300 Pages
- 150 Photos
- Glossy four color cover
- Over 150 pages of radio mods.
- \$29.95 (+\$4.95 ship)

John Loughmiller KB9AT reveals the behind-the-scenes history of the famous R.L. Drake Company, focusing on the glory days, when Drake was king in amateur radio. Every ham and SWL knew R.L. Drake from the outside, but now the inside story of this incredibly interesting company is told. This book also includes 150 pages of useful circuits and modifications for many Drake amateur radios. An entertaining read and a great technical reference for every Drake owner.



Universal Radio
6830 Americana Pkwy.
Reynoldsburg, OH 43068
♦ Orders: 800 431-3939
♦ Info: 614 866-4267
www.universal-radio.com

New books and CDs for worldwide radio!

2001 SUPER FREQUENCY LIST CD-ROM

all broadcast and utility radio stations worldwide

10,200 entries with latest schedules of all clandestine, domestic and international broadcasts on shortwave. 10,900 frequencies from our 2001 Utility Radio Guide. 17,000 formerly active frequencies. All on one CD-ROM for PCs with Windows*. You can search for specific frequencies, countries, stations, languages, call signs, and times, and browse through all that data within milliseconds. It can't get faster and easier than this! - \$ 23 (worldwide seairmail included)



2001 SHORTWAVE FREQUENCY GUIDE

Simply the most up-to-date worldwide radio handbook available today. Really user-friendly and clearly arranged! Contains more than 20,000 entries with all broadcast and utility radio stations worldwide from our 2001 Super Frequency List on CD-ROM, and a unique alphabetical list of broadcast stations. Two handbooks in one - at a sensational low price! 556 pages - \$ 32 (worldwide seairmail included)

2001 GUIDE TO UTILITY RADIO STATIONS

Now includes many HF e-mail Packet-2 radionets that we cracked! Here are the really fascinating radio services on shortwave: ams, diplo, mail-time, metro, military, police, press, and telecom. 10,900 up-to-date frequencies from 0 to 30 MHz are listed, plus hundreds of new decoding screenshots, abbreviations, call signs, codes, explanations, metro / NAVTEX / press schedules, modulation types, all Q and Z codes, and much more! 612 pages - \$ 36 (worldwide seairmail included)



Special package prices: CD-ROM + Shortwave Frequency Guide = \$ 45. More package deals available on request. Plus: 2001/2002 Worldwide Weather Services = \$ 27. Double CD Recording of Modulation Types = \$ 45. Radio Data Code Manual = \$ 36. Radiotelex Messages = \$ 14. WAVECOM Digital Data Analysis and Decoders = the # 1 worldwide ask for details. Sample pages and colour screenshots can be viewed on our comprehensive Internet site (see below). Payment can be made by credit card: Mastercard, Visa, and Eurocard. No cheques! Please ask for our free catalogue with recommendations from all over the world. We've been leading in this business for 32 years! ©

Klingerhous Publications - Hagenlocher Str. 14 - D-72070 Tübingen - Germany
Internet: <http://ourworld.compuserve.com/homepages/Klingerhous>
Fax +49 7071 600849 - Phone +49 7071 62830 - E-Mail klingerhous@compuserve.com

Uniden BC780XLT Trunk Tracker III

We reviewed the Uniden BC9000XLT in March 1995. Its alpha labels, CTCSS decoding, tuning/channel select knob, and wide frequency coverage are major assets.

The number of trunked radio systems has increased steadily since 1995, fueling demand for trunk tracking scanners. Uniden responded with a succession of tracking models, but none of them provides the same flexible step size and mode choices, alpha tags, and wide frequency coverage as the original BC9000XLT.

The new BC780XLT combines the assets of the BC9000XLT with enhanced trunk tracking capability in a downsized cabinet. It is fitted with a DB9 serial port connector and can be controlled or downloaded by a personal computer without using a special level converter.

The BC780XLT includes an additional narrow bandwidth FM mode (NFM), as found in the ICOM IC-R8500. It reduces adjacent channel interference and compensates the audio for signals modulated with lower deviation.

Other improvements include Weather Alert with FIPS code programming, a mute capability, and a beep alert which emits 3 soft beeps at the start and end of transmissions on selected channels or talk group IDs.

❖ Memory

The 500 memory channels are divided into 10 banks of 50. The BC780XLT warns if you try to program a duplicate frequency, though you can override the warning. Channels and banks can be labeled, and both labels are displayed when receiving a conventional signal. Other per-channel parameters include attenuation, tuning step, mode (AM, FM, WFM, NFM), CTCSS and DCS tone squelch, rescan delay, and record enable.

The small, multipurpose VFO/Select knob has a detent action and can be pressed like a key. It can step through the memory channels or vary the frequency, as in the BC9000XLT. The BC780XLT doesn't remember a distinct VFO frequency when changing the knob function between memory channel selector and VFO. A handy repeater offset feature permits you to monitor a repeater input by pressing the VFO/Select knob.

❖ Programming Trunked Systems

Banks may be designated as Motorola Type 1 or 2, EDACS wide and narrow, or LTR trunked. The Motorola Type 2 category is further subdivided by band. Only one trunked system may be programmed per bank. Programming EDACS and LTR systems is tricky because the frequencies must be programmed in the proper channel

numbers. There's no easy way of knowing the proper order unless you find out from someone familiar with the system or devise the sequence through experimentation.

Each trunked bank supports up to 10 lists of 10 talk group IDs each. The BC780XLT doesn't warn of duplicate talk group IDs. You can assign a descriptive alphanumeric label to each talk group ID. Talk groups IDs can be saved during a search or directly entered via the keypad without actually listening to the system.



Unlike the PRO-2067 and PRO-92, the BC780XLT represents EDACS talk group IDs using the AFS (Agency-Fleet-Subfleet) convention. This affords the flexibility of monitoring related sets of talk groups in the same agency, fleet, or subfleet by specifying just the first few digits they have in common.

An I-Call is a station-to-station conversation not heard by other users. The BC780XLT permits monitoring of I-Calls in Motorola and EDACS systems. You can exclude I-Calls, include I-Calls, or hunt for them.

❖ Scanning and Searching

Rescan parameters may be programmed differently for each channel, search bank, and trunked system. The delay may be set at 0, 1, 2, or 4 seconds or an "infinite" setting which terminates the scan when the BC780XLT receives its first signal. Three "ruthless rescan" settings are provided which resume scanning after 2, 5, or 10 seconds, even if the current frequency or talk group is still active.

You can scan combinations of conventional frequency banks and trunked system talk group lists, though there's a brief delay when the BC780XLT starts scanning a trunked bank. Alternatively, you can scan conventional frequencies and search through

trunked systems. You cannot search one trunked system while scanning the talk group lists of another.

After 10 seconds of inactivity during a talk group scan, the BC780XLT hunts for (reacquires) the control channel. We didn't find this to be a minor distraction, nor a problem.

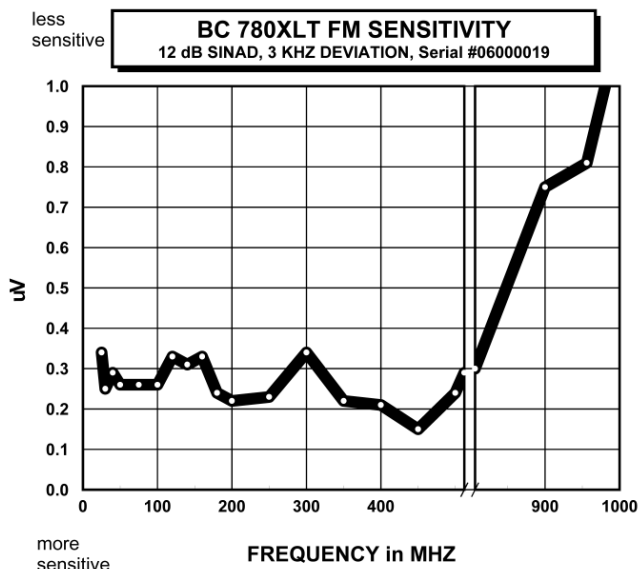
You can program and link up to 10 search ranges, use tone squelch while searching, and lock out up to 200 frequencies during limit searches. A silent Auto Store facility saves active, unique frequencies in one or more memory banks.

Service Search provides 10 banks of factory preprogrammed frequencies and up to 100 lock-outs: rail, air, CB, FRS, special emergency, public safety, news media, TV, ham, and marine.

❖ CTCSS, DCS, and Carrier Squelch

Our BC780XLT's carrier squelch action has too much hysteresis, and about 90 degrees of "play" in the squelch control. Squelch threshold settings vary by band because our scanner's background noise level differs by as much as 7 dB between 40 and 460 MHz using the default modes. The squelch tail is 10 ms long on some signals and longer on others.

The BC780XLT provides both CTCSS and DCS (digital controlled) squelch decoding and display. The CTCSS squelch opens on the proper signal faster than our BC9000XLT, which clips the first part of a transmission. The penalty for using CTCSS is a slower scan speed when skipping over signals without a matching CTCSS tone. The practical scan speed slowed dramati-



cally from 69 channels/sec to 17 channels/sec when our BC780XLT heard, but skipped over a signal without the proper CTCSS.

The CTCSS display feature is sluggish compared to the almost instantaneous PRO-2067 display. Our BC780XLT takes 15 seconds to step through 38 CTCSS tones then listen for a DCS code, looking for a match. The tone finder scheme doesn't work well when transmissions are brief.

♦ Usability and Performance

Our BC780XLT is sensitive – more sensitive in the 860 MHz range than our PRO-2067 (s/n 00315). We found only 15 birdies (fig. 2). It is well behaved on an outdoor antenna, though we hear a few intermod products in the VHF-high band produced by a strong 158.7 MHz pager mixing with a NOAA weather transmitter. Our BC9000XLT receives the same intermod but our ICOM IC-R8500 does not.

The BC780XLT has many more features than keys on its keypad, so you set parameters by navigating an extensive menu system up to four levels deep. Enabling the attenuator or choosing a rescan delay for a channel requires a multi-key

Table 2: BC780XLT Birdies (MHz)

29.7, 50.16, 134.1, 163.8, 245.65, 245.7, 348.95, 349.0, 378.95, 379.0, 806.05, 820.8, 895.5, 925.2, 955.2

sequence instead of a single key press. We found the menu system intuitive and easy to learn. The instruction manual documents the menu in clear, concise diagrams.

Our BC780XLT's audio quality is acceptable, but tinny. We prefer to use an external speaker that can be pointed toward the listener. Two 1/8" jacks on the rear panel are provided for external speaker and reduced level audio output for recording.

The reduced level audio output can be enabled on a per channel and per talk group ID basis. Its level varies with the volume control set-

ting and we measured its voltage at 15 dB below the external speaker output.

The full, lighted keypad is easy to see, but the information packed LCD display uses tiny digits for active banks.

♦ Bottom Line

Except for a fussy squelch, our BC780XLT is an excellent performer – the "top dog" in trunking scanners. It is packed with most of the features a scanner user would want and they are thoughtfully implemented.

The user manual is well written and teaches better than the PRO-2067 manual. Even so, the BC780XLT is an advanced model. An inexperienced consumer may find programming EDACS and LTR trunked systems too challenging.

Table 1: Measurements

Uniden BC780XLT Trunk Tracker III

s/n 06000019

Grove price \$349.95

Uniden America Corp.
4700 Amon Carter Blvd.
Fort Worth, TX 76155
tel. (800)554-3988

Frequency coverage (MHz):

25 - 512, 806 - 956, and 1240 - 1300 (USA version, cell bands blocked)

Step sizes (kHz):

5, 7.5, 10, 12.5, 25, 50, 100, and auto

Modes: AM, NFM, FM, WFM

FM modulation acceptance: 13 kHz

Intermediate Frequencies (MHz):

380.7/244, 45/10.7, and 0.45

Image rejection due to 1st IF:

45 dB @ 40 MHz
60 dB @ 15 MHz
67 dB @ 460 MHz
77 dB @ 806 MHz

Attenuator:

5 dB @ 40 MHz
12 dB @ 155 MHz
9 dB @ 460 MHz
20 dB @ 860 MHz

Audio output power, measured at ext. speaker jack:

2.3 W @ 10% distortion

Tape output audio:

15 dB below ext. speaker audio

Squelch tail length (1uV @155 MHz): 10 ms.

Practical memory scan speed: 69 channels/sec.

Current consumption @ 13.8 VDC

off: less than 6 uA

scanning (lamps off): 163 mA

full volume (lamps off): 242 mA

lamps: 100 mA additional

More than just radios....

You probably know all about the great value of **ADI** brand transceivers, but **PRYME Radio Products** makes more than just radios. In fact, we manufacture a full line of aftermarket accessories for all kinds of radios, not just our own! Our line includes accessories for Kenwood, Icom, Yaesu, and many more! From Family Radios, to scanners, to amateur or commercial handheld radios, we have the right item for the job. Our accessories are reliable, innovative, and affordably priced.

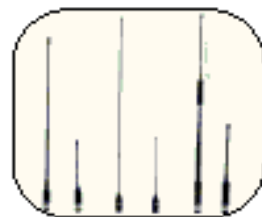
Audio Accessories

Our innovative audio products have made us famous. From the comfort of our SPM-400 mini-boom microphone to the low-profile of our EH-1 "invisible" ear phone and SPM-700 surveillance mic, we have the right accessory for the job!



Antennas for Handhelds

Most stock antennas for scanners or portable radios are extremely poor. Upgrading to a better antenna can make a huge difference in performance. Our antenna products are specifically designed for maximum performance and durability.



Batteries / Portable Power

We offer many models of rechargeable battery pack for today's most popular handheld radios, as well as a number of portable "power stations" for those who need "power to go."



Order on-line from our entire line of high quality, accessories. Visit our **on-line store** on the web at:

<http://www.prymebattery.com>

PRYME
Radio Products

by **PREMIER Communications Corp.**
480 Apollo St. #E • Brea, CA 92821
Phone: 714-257-0300 • Fax: 714-257-0600
Web: <http://www.adi-radio.com>

Icom's Neat IC-718

When I was a kid growing up in Ohio, I got a germanium diode radio for Christmas one year. One step up from a "cat's whisker" crystal radio, it had an alligator clip that would attach to a radiator to provide a ground, a socket for a primitive folding rod antenna, an earpiece, and a sliding rod that tuned the stations.

There were no batteries; it was entirely self-powered by the radio waves it received. There wasn't any volume control either – whatever volume from the radio station made it through the earpiece was what you got. But it received AM broadcast stations, and I loved to listen to it under the covers at night when I was supposed to be asleep.

About the same time, my Dad had purchased a wire gizmo that was supposed to boost the quality of our TV reception. It didn't do anything for the TV, but one night I tried it with my little germanium diode rig. Suddenly, I found myself listening to jazz from New Orleans – from faraway, exotic New Orleans. I was thunderstruck by the idea of long-range radio.

Even better (I was to discover as an adult when I got my ham license) is the idea of long-range two-way radio. The notion that I can talk into a microphone in upstate New York and carry on a conversation with someone in Florida, or Colorado, or New Zealand is simply magic.

♦ Easy Access to the Ham Bands

I was reminded of this dramatically when I began testing the Icom IC-718, an HF all-band transceiver. This diminutive rig measures just 9.5 inches wide, 3.75 inches high, and 9.5 inches deep, barely bigger than the manual antenna tuner that I parked it on. The IC-718 tips the scales at 8 pounds six ounces.

Among the goodies offered by the IC-718 are 0.03-29.999999 MHz frequency coverage, USB, LSB, CW, RTTY (FSK), and AM modes, adjustable transmit power (5-100 watts, SSB, CW, RTTY; 2-40 watts AM), ad-

justable noise blanker, RF attenuator, preamplifier, 101 memory channels, voice-activated transmit, microphone compressor, built-in CW keyer, and a variety of scanning functions. That seems like a lot for a radio with a street price on the sunny side of \$800. About the only significant omission for the radio that includes a CW keyer is a CW filter. Only a sideband filter is provided.

If you want more goodies, you can order them a la carte, including additional filters (CW and sideband), a choice of automatic antenna tuners, digital signal processor, voice synthesizer, desk microphones, DC power supply, linear amplifier, and more.

At the upper left corner of the rig, there's a front-firing speaker – small, to be sure, but it beats the heck out of the larger top-firing speakers found on so many ham transceivers. Below the speaker are jacks for headphones

body of knob. You can spin this beauty until the cows come home and never raise a blister. Above the tuning knob are buttons for controlling mode, filter selection, and tuning step.

To the right of the tuning knob is a bank of buttons, divided into three sections, for direct frequency entry, memory functions, noise blanker, compressor, preamp, antenna tuner (if you have this option), as well as VFO selection and a variety of other functions.

On the back of the IC-718, you'll find the jacks and sockets you would expect: antenna, DC power, automatic antenna tuner control, personal computer connection, external speaker, CW paddles, linear amplifier, and so on – some 10 connectors in all.

♦ Putting it to the Test

The IC-718 passed the Elliott Idiot test – I could plug it in and operate most functions without ever looking at the manual.

The performance put a grin on my face. The receiver was quiet and smooth. I called CQ on ten meter sideband and worked a 90-year-old gentleman from England who was vacationing in Florida. My next call yielded a Colorado man my age who is both a physician and an engineer. Involved in a high-tech company, he was driving around stashing water bottles for his

long-distance run that morning. We enjoyed a 30-minute chat that reminded me of the many pleasures on long-distance rag chewing, and I got compliments on the quality of the audio. Because I am not a CW operator, I did not test the IC-718 in CW mode.

The bottom line: over the years, I've spent enough money on ham radios to finance (by today's standards) an excellent used car, but I've also learned that more money spent, while it often buys more performance, does NOT always mean more operating pleasure. The Icom IC-718, however, delivers a very high FPB (fun per buck) quotient. It offers worthy performance, ease of operation, and buckets of fun at very reasonable cost. For a guy like me, an inveterate Conversation Hunter, it's an excellent radio, and I give it my hearty recommendation.



and the hand microphone that comes with the IC-718.

To the right of the speaker is a backlit amber liquid crystal display that serves as information central for the rig, showing frequency, mode, signal strength, VFO status, and a bunch of other information that would be of interest to the operator. While the display was scarcely gigantic – only a few square inches – it was plenty legible even for my bifocal-assisted, over-50 eyes. Below the display are the power button and two sets of concentric knobs. The leftward set controls volume and RF gain/squelch; the one on the right provides command of receiver incremental tuning. Next to that is a dial lock button.

Slightly to the centerline of the rig is a large dimpled tuning knob that even includes a dimple that rotates independently of the

MT REVIEW

MFJ-616 Speech Intelligibility Enhancer

by Bob Grove

Like many of us, Martin Jue, the man behind MFJ Enterprises, noticed his hearing becoming less acute with age. While a simple, agile, audio filter could help him distinguish desirable audio from the din of muffled noise on his radios, each ear had its own requirements. Realizing that he wasn't alone with this problem, he went to work designing a filter with separate left/right audio contouring.

Martin further discovered in his research which parts of the audio spectrum are more important to intelligibility than others; these became his rolloff edges for the adjustable filters.

The new MFJ-616 allows left/right amplitude balancing between dual 3-watt amplifiers and can drive external stereo speakers (including computer multimedia units) as well as headphones. A dual input allows selection from two audio sources. The unit is very easy to use, and operates from a 12 VDC source (not supplied). Input impedance is nominally 500 ohms (line



input), and for those with profound hearing loss, there is an internal solder pad allowing headphone audio boost above that normally provided.

Our Test

The all-analog circuit features an equalizer bank of four separate frequency-contouring controls, centered at 300, 600, 1200, and 2400 Hz. Manual experimentation of the controls allows attenuation or boost of up to 12 dB from center (flat) position. This provides de-emphasis of the

low frequencies that constitute a minimum of speech intelligibility, emphasis for those of us with high-frequency loss, and comfort-contouring of the mid frequencies.

While the 616 calls for medium impedance (500 ohm) line input, we found that direct connection to a low-impedance earphone/speaker jack on a receiver or scanner worked just fine. Purists may opt to add an external resistive pad to normalize the load.

A convenient pushbutton bypass switch allows instant comparison of equalization settings to non-compensated signals to determine the effectiveness of the controls.

We found the MFJ-616 Speech Intelligibility Enhancer not only easy to use, but doubly useful: Not only is it quite effective in compensating for hearing loss, but it also optimizes desired audio amidst the din of interference on the noisy radio spectrum.

WRTH 2001 review

by Gayle Van Horn

World Radio TV Handbook has recently released its 55th edition, and as last year it has been met with a mixture of pleasure and consternation by radio hobbyists. The 2001 edition has increased its page count to 656 pages, reportedly as a result of reader feedback and on-going updates, and in order to address evolving changes within the hobby.

Readers have come to depend upon the *WRTH's* respected, objective chapter on *Receiver Reviews* that includes scanners, PC radios, and table-top receivers. Home-brew and antenna enthusiasts will most likely find *Antennas and Analysers for the SWL* helpful, while

George Jacobs' *HF Broadcast Reception* chapter predicts 2001 will be another good year — with less interference!

Propagation, the number one prerequisite for DX, is featured in a most helpful, *Introduction To Propagation Theory*. If you are confused by the importance

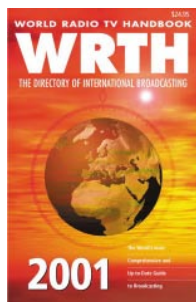
of the ionosphere, troposphere, and radio propagation mechanisms, this is an excellent no-nonsense explanation.

In another chapter, take a tour of BBC's Monitoring Service in Caversham and find out just what has been going on in their listening room for decades.

Unfortunately, many on-going complaints by hobbyists still remain unaddressed, especially concerning the National Radio section. As one DXer commented, "errors reported for years still remain untouched." Aussie's report their medium wave section is a mess, while the Russian section has reportedly improved. U.S. mediumwave coverage also receives a thumbs down from many.

Personally, I continue to find their national and international broadcast sections a time-consuming and unnecessary division for the active DXer. Wouldn't it be more advantageous to arrange both national and international information under each county (sorted by continent), instead of constantly shifting to the back of the book?

Despite reports of errors, typos and the lack of corrected data from DXers, I find *WRTH* a comprehensive guide for national and international radio broadcasting. *WRTH* continues to offer the listening world a reference manual that should be on every DXer's bookshelf. You can find it at book stores and dealers such as Grove Enterprises (1-800-438-8155 or write PO Box 98, Brasstown, NC 28902) for \$24.95 (plus \$5.95 shipping from Grove).



Rave Review
Pop Comm
April '96

SEE US ON THE WEB!
www.vikingint.com

Professional 10 HOUR RECORDER

"BUILT LIKE A BATTLESHIP"



- Heavy duty commercial recorder - NOT improvised from consumer models
- 12, 14, and 16 hour models also available
- BUILT-IN voice activation (add \$30)
- Applications information included
- Dimensions: 11.5 x 7.0 x 2.75"

COD's OK. Calif. residents add tax. Sorry, no credit cards. Free catalog USA only; other countries \$5.

SPECIAL
Monitoring
Times Price...

\$159

FREE 40-PAGE SPECIAL EQUIPMENT CATALOG!

Viking International
Factory Direct

150 Executive Park Blvd. #4600 San Francisco, CA 94134
Phone: (415) 468-2066 • Fax: (415) 468-2067 "Since 1971"

What's NEW

Tell them you saw it in *Monitoring Times*

New Products from Midland

Midland announced several new radios at last winter's Consumer Electronics Show. The new SpeakEasy line of FRS radios to be available this summer will be Midland's smallest and lightest to date. They will incorporate the features most asked for according to Midland's customer surveys, including call/paging, accessory jacks and in-unit battery charging.

The new **F-10** will be a basic 14 channel unit without codes in a fun egg-shaped case that cradles comfortably in the hand. The **F-12** has the same size and shape, but adds 38 CTCSS sub-codes. The **F-14** model adds 83 digital sub-codes for a total of

121 sub-codes. NOAA weather radio reception is featured in the 14 channel, no-code model **F-15**, and the **F-17** trades weather for an FM broadcast radio tuner.

Two more radios with slightly different styling round out the

new line. The **F-25** is a 14 channel/38 sub-code radio that includes a folding antenna and voice scrambling, both new features for Midland.

Midland's **F-28** is perhaps the most exciting addition

to their line, since it includes a built-in 400 MHz scanner to pick up race car radio frequencies. Destined to become a must-have item for race fans, the 14 channel/38 sub-code **F-28** will feature racing colors and a folding antenna, plus vibrating call alert for easy use at the track.

Suggested retail price on the

new line is undetermined at this time. For more information, contact Midland Consumer Radio, Inc. 1670 N. Topping Ave, Kansas City, MO 64120-3865; phone (816) 241-8500; fax (816)-241-5713; or visit Midland's website at <http://www.midlandradio.com>

DUO-Aria Multi-Format Digital Audio Player

Monitoring Times readers – especially those with internet access – are becoming accustomed to the idea of clicking on a link and being able to listen to music, to a foreign broadcast, to examples of digital communications modes, or even download a book in audio format. Digisette is a New Jersey company which has devised a simple but ingenious way to make such digital files playable almost anywhere with surprising ease. Their innovative Duo-MP3 and Duo-Aria products earned a Best of Show award at the most recent Consumer Electronics Show.

Similar in appearance to the cassette adapters which allow you to play CD audio from a portable CD deck and hear it through your car's audio system using the tape player, the DUO-Aria is all that and more. Like the cassette adapter, it may be inserted into a standard audio cassette player for high fidelity playback of digital audio through your home or car sound system, but it can also act as a stand-alone digital audio player. Just plug in the earphones and slip the slim, aluminum-cased "cassette" into a shirt pocket or wear it on your belt for personal listening.

The Duo-Aria contains 32 megabytes of flash memory, which is expandable via an optional 96MB MultiMediaCard. The included Ni-MH battery will play 6 hours on a charge, and can be charged using the included 110 V charger or while playing in the car via the DC charger. The Duo-Aria requires a USB port to connect to your computer; the other model, the Duo-MP3, uses an 18-pin parallel port.

What do you listen to? You can download digital audio downloaded from the internet, you can digitize music from your own CDs and customize your own playlist using the provided RealJukebox software, or you can listen to more than 18,000 titles of Internet-delivered spoken word audio (audiobooks, audio digests of major newspapers, magazines and much more) available from *Audible.com*™, for example. The Duo-Aria may be upgraded to sup-



port new audio modes as they become available.

The Duo-Aria has a suggested manufacturer's retail price of \$249; at press time the price through <http://www.microwarehouse.com> was \$219. If you purchase it through Audible.com you can get the player for \$99, plus a \$9.95 monthly subscription fee. A model with fewer features and less upgradable is the Duo-MP3 player, which is selling for \$169 through <http://www.amazon.com>. For more dealer outlets and information, consult the web site at <http://www.digisette.com>.

FROM KLINGENFUSS PUBLICATIONS

Certainly the most prolific, and arguably the most reliable shortwave utility databases are these, massively updated each year by the quintessential shortwave expert, Joerg Klingenfuss. Let's take a look at some of his most popular offerings for 2001.

2001 Shortwave Frequency Guide

Combining more than 20,000 entries from both broadcasting and utilities, this massive, 556 page book is an exhaustive reference for the dedicated shortwave listener. Primary sort is by frequency.

For utilities listeners, the frequencies, call signs, modes, locations, and even associated duplex or two-frequency simplex frequencies are given as appropriate for every entry.

For the international broadcast devotee, listings include frequencies, station names, locations, languages, target areas, and schedule times. Listings are cross-referenced by frequency and broadcasting organization.

Excellent informative chapters are included to explain modes, abbreviations, and system details used around the world.

\$34.95 plus shipping from Grove Enterprises and other *MT* advertisers

Guide To Utility Radio Stations

This best seller is now up to 612 pages to hold nearly 11,000 frequencies between 3 and 30 MHz used by aeronautical, maritime, military, government, UN, law enforcement, Red Cross, diplomatic services, and more.

Organized by ascending frequency, listings include call sign, agency, location, mode, associated frequencies, and schedules if known. Cross-referenced by country of origin, then service.

As always, Klingenfuss includes a comprehensive collection of useful information and screen

shots, such as NAVTEX schedules, International call signs, NATO routing indicators, commonly-encountered abbreviations, Q and Z codes heard on CW and digital modes, as well as standard lists of emissions designators, station classes, and even official aeronautical and maritime band plans with folding charts.

\$39.95 plus shipping from Grove Enterprises and other *MT* advertisers

Guide To Worldwide Weather Services

Not only radio sources on meteorological information like Navtex, radiofax, and radiotelex, but the Internet as well are in this compendium. This worldwide directory provides hundreds of on-air and on-line sources for up-to-date satellite photos, weather maps, crop calendars, jet stream velocities, long-term forecasts, ozone warnings, surf reports, hurricane and cyclone tracks, ultraviolet radiation, and more.

\$34.95 plus shipping from Grove Enterprises and other *MT* advertisers

Super Frequency List On CD-Rom

If you like to access your data from your computer, this combination international broadcast and shortwave utility database is the answer. It requires a PC with Windows – that's it.

Browse or search for frequencies, countries of origin, station by name or call sign, even time schedules. Essentially, this is the popular *Short-wave Frequency Guide* on a CD.

Hundreds of good screen shots are included to assist in identification of unknowns, as well as the Radioraft digital-data-decoding shareware program.

\$29.95 plus shipping from Grove Enterprises and other *MT* advertisers.

Amateur Radio Explained

by Ian Poole

Ian Poole has written a number of articles for *Monitoring Times* as well as numerous books in the amateur and electronics fields. His most recent book is geared toward the person who is just discovering amateur radio. For anyone trying to explain what amateur radio is all about to a spouse, friend, or group, this book will help.

Following the success of Poole's book, *Amateur Radio for Beginners*, this new volume covers information about what can be heard, the practical aspects of how to set up a station, techniques to use to hear stations from far away, the codes and jargon that are used, frequencies and frequency bands, receivers, and much more. The book is written in a way which the newcomer can understand, and it gives the vital information necessary to get started, especially if the reader lives in the UK.



Amateur Radio Explained ISBN 1-872309-70-4 is a paperback book, 146 pages, published by the Radio Society of Great Britain. It is available

for £9.99 from RSGB Headquarters, Lambda House, Cranborne Road, Potters Bar, Hertfordshire, EN6 3JE; +44 (0)1707 660888; sales@rsgb.org.uk. It can also be found at www.amazon.co.uk

Grundig Satellit

By Thomas Baier

Fans of the Grundig Satellit radio and flea market addicts will want to get a copy of *Grundig Satellit - All Models in Word and Pictures*. In 126 pages and 120 pictures all the details are documented in black and white for each model of this famous series from 1964 to 2000.

The 5-3/4 by 8-inch format book is available in the U.S. from Universal Radio Inc, 6830 Americana Pkwy, Reynoldsburg, OH 43068; 800-431-3939; <http://www.universal-radio.com>

New Australian RADIOMAG

Bob Padula sends news of a new monthly independent Australian commercial radio publication titled *RADIOMAG*, edited and published by Chris Edmondson, former editor of *Radio and Communications* magazine.

RADIOMAG will have a team of expert, experienced staff writers. Bob Padula will manage a department titled "Broadcast Monitor," covering shortwave, mediumwave, and FM, as well as other articles related to new equipment, anten-

nas, book reviews, DXpeditions, propagation, and information of interest to new listeners. Other columns will cover the gamut from satellite monitoring to the internet (Tom Sundstrom).

General information about *RADIOMAG* is available from Chris Edmondson, VK3CE, Publisher and Editor, Box 123, Eagle Heights, Queensland 4271; 07 5545 0666 phone, 07 5545 0622 facsimile; Web page: <http://www.radiomag.com>. A 12-month subscription (A\$64.80 or about US\$36) is currently being offered at an introductory A\$44.80 (about US\$25), but this may be domestic only. International first class delivery is around US\$52.80.

Caveat Emptor

Monitoring Times has received reports of two persons who ordered but did not receive a product mentioned in the November 2000 *What's New*. The Cellular Phone Alert Pen was advertised in a flyer forwarded to *MT* by one of our readers. It was supposedly available from Preferred Customers Guild, which had a P.O. Box in Central Islip, NY. These customers were unable to contact the company or find any proof of its existence. We'll never know if the product was bogus, but Preferred Customers Guild and their money-back guarantee certainly seem to be!

Books and equipment for announcement or review should be sent to "What's New?" c/o Monitoring Times, P.O. Box 98, 7540 Highway 64 West, Brasstown, NC 28902. Press releases may be faxed to 828-837-2216 or emailed to mteditor@grove-ent.com.



TIMESTEP

If you own an ICOM PCR1000, all you need for Weather pictures is an antenna, a preamplifier and a TIMESTEP interface for your computer.



If you would like to see colored weather images as they move across the United States and Europe, call or email us. It is easier than you may think. With a dish looking out a South facing window, a Feed, an LNA, a Timestep Receiver and Timestep Interface, your computer and you are ready to receive these kinds of images.






U.S. GOES/WEFAX IMAGE

Dish in window

Timestep interface

European WEFAX image

We have all you will need for INMARSAT except the Receiver

SWAGUR - TIMESTEP

email: swagur@swagur.com

Box 620035 - Middleton, WI 53562

Phone/Fax 608-592-7409

Web site www.swagur.com

HERE'S WHAT OUR READERS ARE SAYING ABOUT MT EXPRESS:

"No doubt about it, the future is here! Sure nice to get the magazine so early, this has got to be the way! Thanks for a great job!"

- Charles (Chuck) Boehnke
Keaau, Hawaii

"You and the MT staff that put this project together have done a FANTASTIC job. You would seem to be the leaders in the field presenting material in this manner so it can be archived so easily. This is the way to receive a magazine."

- Don Nauer

Clip and mail this ad along with your payment or call us to subscribe or renew to Monitoring Times!

Subscribe to MT for as little as \$14.00 (U.S. Second Class Mail)



7540 Hwy. 64 W.; Brasstown, NC 28902
1-800-438-8155 US and Can.; 828-837-9200; Fax 828- 837-2216
e-mail order@grove-ent.com

	6 months	One Year	Two Years	Three Years
US Rates	<input type="checkbox"/> \$14.00	<input type="checkbox"/> \$25.95	<input type="checkbox"/> \$49.95	<input type="checkbox"/> \$73.95
US 1st Class	<input type="checkbox"/> \$29.50	<input type="checkbox"/> \$56.95	<input type="checkbox"/> \$111.95	<input type="checkbox"/> \$166.95
Canada Surface*	<input type="checkbox"/> \$21.00*	<input type="checkbox"/> \$38.50*	<input type="checkbox"/> \$73.95*	<input type="checkbox"/> \$109.95*
Foreign International*	<input type="checkbox"/> \$30.00*	<input type="checkbox"/> \$57.50*	<input type="checkbox"/> \$112.95*	<input type="checkbox"/> \$168.50*
Electronic Subscription		<input type="checkbox"/> \$19.95	<input type="checkbox"/> \$38.90	<input type="checkbox"/> \$57.85

*All payments must be in U.S. Funds drawn on a U.S. Bank!

Name _____ Address _____
City _____ State _____ Zip _____ - _____ Country _____
CC# _____ Exp. Date _____
Signature _____

If you are currently a subscriber to Monitoring Times, please check your label to determine the expiration date of your subscription. **MasterCard, Visa, and Discover Card accepted!**

INDEX OF ADVERTISERS

Antique Radio Classified	77
AOR	Cover III
AWA	77
Communications Electronics	73
Computer Aided Technologies	9
Computer International	7
Grove Enterprises	13,25,31,81
Grundig	2,3
ICOM	Cover IV
John Figliozi	23
Kevin Carey	79
KIWA Electronics	79
Klingenfuss	83
Monitoring Times	90,91
OptoElectronics	Cover II
Popular Communications	15
Premier Communications	85
Radiomap	25
Radioworld Inc.	75
RC Distributing	25
Scanner Master	29
Skyvision	23
Small Ear	77
Small Planet Systems	79
Swagur Enterprises	89
Universal Electronics	62
Universal Radio	83
Viking	87
W5YI	75
WiNRADiO	1

EDITORIAL STAFF

Correspondence to columnists may be mailed c/o Monitoring Times; any request for a reply should include an SASE.

Frequency Manager	Gayle Van Horn	gayle@webworkz.com
Frequency Monitors	Mark J. Fine	mark.fine@fineware-swl.com
Program Manager	John Figliozi, KC2BPU	ifiglio1@nycap.rr.com
American Bandscan	Doug Smith, W9WI	w9wi@bellsouth.net
Antenna Topics	W. Clem Small, KR6A	clemsmall@hotmail.com
Ask Bob	Bob Grove	bgrove@grove-ent.com
Beginner's Corner	Ken Reitz, KS4ZR	ks4zr@firstva.com
Below 500 kHz	Kevin Carey, WB2QMY	lowband@gateway.net
Bright Ideas	Gary Webbenhurst	ab7ni@arrl.net
Closing Comments	Bob Grove	bgrove@grove-ent.com
Communications	Rachel Baughn	mteditor@grove-ent.com
Computers and Radio	John Catalano	j_catalano@conknet.com
Digital Digest	Stan Scalsky	sscalask@mail.ameritel.net
	Mike Chace	mike.chace@mindspring.com
Easy Access Radio	Jock Elliott KB2GOM	lightkeeper@sprintmail.com
Federal File	Larry Van Horn, N5FPW	larry@grove-ent.com
Letters to the Editor	Rachel Baughn	mteditor@grove-ent.com
Milcom	Larry Van Horn, N5FPW	larry@grove-ent.com
On the Ham Bands	T.J. Arey, N2EI	tjarey@home.com
Outer Limits	George Zeller	georgez@nacs.net
Plane Talk	Jean Baker, KIN9DD	jeanieandbob@earthlink.net
Programming Spotlight	John Figliozi, KC2BPU	ifiglio1@nycap.rr.com
Propagation	Jacques d'Avignon	monitor@rac.ca
QSL Corner	Gayle Van Horn	gayle@webworkz.com
Radio Restorations	Marc Ellis	mfellis@enteract.com
Satellite Radio Guide	Robert Smathers	roberts@nmia.com
Scanning Equipment	Bob Parnass, AJ9S	parnass@megsinet.net
Scanning Logs	Larry Van Horn, N5FPW	larry@grove-ent.com
Scanning Report	Richard Barnett	ScanMaster@aol.com
SW Broadcasting	Glenn Hauser	wghauser@yahoo.com
SW Broadcast Logs	Gayle Van Horn	gayle@webworkz.com
The Fed Files	Larry Van Horn, N5FPW	larry@grove-ent.com
The Launching Pad	Ken Reitz, KS4ZR	ks4zr@firstva.com
Tracking the Trunks	Dan Veeneman	dan@signalharbor.com
Utility World	Hugh Stegman, NV6H	utilityworld@ominous-valve.com
View from Above	Lawrence Harris	Lawrence@itchycoo-park.freeserve.co.uk
Washington Whispers	Fred Maia, W5YI	fmaia@texas.net
What's New	Rachel Baughn	mteditor@grove-ent.com

Ads for **Stock Exchange** must be received 45 days prior to publication date. All ads must be paid in advance to *Monitoring Times*.
Ad copy must be typed for legibility.

1-3/4" SQUARE DISPLAY AD: \$50 per issue if camera-ready copy or, \$85 if copy to be typeset. Photo-reduction \$5 additional charge. For more information on commercial ads, contact Beth Leinbach, 828-389-4007.

STOCK EXCHANGE

Monitoring Times assumes no responsibility for misrepresented merchandise.

LINE ADS

NON-COMMERCIAL SUBSCRIBER RATES: \$.25 per word — *Subscribers only!*
 All merchandise must be personal and radio-related.

COMMERCIAL, NON-SUBSCRIBER, AND MULTIPLE SALES RATES: \$1.00 per word. Commercial line ads printed in bold type.

NOTICE: It is unlawful to buy cellular-capable scanners in the United States made after 1993, or modified for cellular coverage, unless you are an authorized government agency, cellular service provider, or engineering/service company engaged in cellular technology.

WANTED: Panasonic RF-2200 shortwave radio, in good shape. (908) 874-2328

WANTED: Any auto shortwave radio. Philips 777, Becker, Hallicrafters SX88, etc. any condition. (516) 223-4638. Ask for Earl.

SALE: Sony 2010. New in box. \$300. Call Mark at (419) 339-9716.

ELECTRONIC COMPONENTS. Parts bonanza for manufacturers, engineers, hobbyists. Thousands of chip capacitors, resistors, transistors, ICs, diodes, plus valuable items such as signal strength meters, LCDs, hardware, much more! All at a fraction of the original cost. Grove Enterprises, Inc., 828-837-9200, order@grove-ent.com.

Join the Club!

Open to hobbyists worldwide, the **CANADIAN INTERNATIONAL DX CLUB** is Canada's national, general coverage radio club serving members since 1962. The **Messenger** features columns on AM/FM, shortwave, utilities, scanning, QSLing, pirates, ham radio and more. Send \$2 for a sample copy to:

CIDX

P.O. Box 67063-Lemoyne
 St. Lambert, Quebec, Canada J4R 2T8
email: cidxclub@yahoo.com
web: www.anarc.org/cidx/

CUMBRE DX

is the world's best DX publication. Every issue features news and loggings that you just won't find elsewhere. But the best part about Cumbre DX is that it is absolutely **FREE!**

FOR YOUR FREE SAMPLE COPY, SEND AN EMAIL TO:
cumbredx@yahoo.com

Visit us online at: www.cumbredx.org

Listening In

That's what we do and who we are!

For over 25 years we have published one of the world's leading radio magazines, *Listening In*. Now available in PDF files, in print or on tape for the sight-impaired. Mention MT and get a free sample.

Ontario DX Association

Box 161, Willowdale Station A,
 Toronto, Ontario M2N 5S8 Canada
odxa@compuserve.com
www.odxa.on.ca

Windows Logging Software With Audio Processing and QSL Imaging

DXtreme Reception Log 2000™ lets you:

- Log the stations you have heard.
- Record and playback audio clips of the stations you have logged.
- Create paper and electronic reception reports *automatically*.
- Scan and view images of your QSLs.
- Track the performance of your station.

Visit our Web site today! Be sure to enter our Quarterly Prize Giveaway!



Web: www.dxtreme.com
 E-Mail: sales@dxtreme.com

Hand-Held Scanners!

MetroWest is your source for:

Hand-Held Scanners
Premium Battery Packs
Drop-In Chargers
Specialty Antennas
Books and More

SEND OR CALL FOR A FREE CATALOG: **(708) 354-2125**
 MetroWest, Inc. 822 N. Spring LaGrange Park, IL 60526
ORDERS ONLY (800) 657-1475

Established Scanner/Electronics Mail-Order Business For Sale

- Large customer base
- 15-year history with excellent customer satisfaction
- Unique products
- Productive Website
- 800# Phone Line

Easily re-locateable to any area.

Call (708) 354-2536

Serious Inquiries Only Please

RFP THERMO MUGS

16-oz \$10 each, ppd



P.O. Box 20728 - M
 PORTLAND, OR 97220

SCANNER ANTENNAS

HF/VHF/UHF Super Disccone \$45.95
 VHF/UHF Disccone \$29.95
 Mag-mount Mobile Scan. Ant. \$24.95
 Super Scan Duck HandHeld Ant. \$21.95
 plus S&H

See These Plus Many, Many More At:

www.antennawarehouse.com
 811 9th Ave.
 Camanche, IA 52730
 Tollfree MC/VISA Order Line
877-680-7818

HUGE 100 PAGE CATALOG

- Shortwave & Ham Gear
- Scanners & RTTY/FAX
- Antennas & Accessories
- Radio Books & CDs.

Send \$1 to **Universal Radio**
 6830 Americana Pkwy.
 Reynoldsburg, OH 43068
 Tel. 800 431-3939
www.universal-radio.com



MT ANTHOLOGY 2000 EDITION

A Whole Year of MT on ONE CD!

That's right, an entire year of Monitoring Times, complete with full articles, reviews, and even advertisers, all on one CD. Completely searchable and user-friendly, this CD is the perfect companion when you're wondering "what issue was that review in" or "I remember I saw how to build that antenna in ONE of these!" Imagine being able to search for just what you need in a matter of seconds! It's the radio-room reference you've been looking for! **Order yours today!**

Order SFT27-00 today for only \$19.95
(\$14.95 for current MT subscribers)

Grove Enterprises, Inc. 800-438-8155

www.grove-ent.com

7540 Highway 64 West Brasstown, NC 28902



By Bob Grove,
Publisher

In Tribute

The world of radio communications has lost three prominent citizens in rapid succession; their contributions are immeasurable. The first loss is mourned particularly by his professional colleagues, and the other two by the hobbyists.

Al Gross, licensed as **W8PAL** since 1934 at the age of 16, never slowed down. In 1938, the year I was born in Cleveland, Ohio, Al was in a Cleveland high school where he combined a simple transmitter and receiver into one portable box; he called it the “walkie-talkie.”



His simple invention caught the eye of the Office of Strategic Services (OSS), the forerunner of the CIA, and it was rapidly adapted to a legion of devices used in World War II, including the milk-carton-shaped BC611, featured in every war movie.

His invention of the metal detector for treasure hunters and industrial pipe location was focused by the military into the pie-shaped-head SCR625 mine detector. Years later, when I was developing metal detectors to sell, Al volunteered to test them, often sending recommendations for improvements.

Following WWII, Al founded his own two-way-radio manufacturing company, eventually naming it “Citizens Radio Corporation”; yes, that’s right – Al was the father of Citizens Band Radio!

Al’s fascination with communications led him to patent dozens of innovative products, some of which became the cellular telephone and the pager. Unfortunately, his pat-

ents were so early that the industries evolved after the patents expired, so he never earned the royalties to which he could have been entitled.

But the potential of his genius was caught by one visionary cartoonist, Chester Gould. With Al’s permission, Dick Tracy now had a wristwatch radio!

His list of recognitions and awards is astounding, including the Radio Club of America Fred B. Link Award, the Marconi Memorial Gold Medal of Achievement, the Veteran Wireless Operators Association Award, the IEEE Edwin Howard Armstrong Achievement Award, the Lemelson-MIT Lifetime Achievement Award, and Ronald Reagan’s Presidential Commendation in Telecommunications.

Al’s talents have been utilized by many major players in the communications industry, including GTE, Sperry, Westinghouse, and most recently, Orbital Sciences Corporation. This renaissance man passed away on December 21, 2000, in Sun City, Arizona, at the age of 82. He is sorely missed.

Joe Carr, K4IPV, represented the admirable combination of modesty and productivity. This unassuming man’s books and articles have appeared in untold numbers over several decades, appealing primarily to hams and shortwave listeners. Most of us remember him for his popular publications on antennas and simple circuits.

Joe’s byline has appeared in numerous publications including *MT*, *Popular Communications*, *73*, *QST*, *Nuts and Volts*, and *Popular Electronics*. Besides thousands of technical articles, he wrote more than 100 books, including *Joe Carr’s Loop Antenna Handbook*, *Practical Antenna Handbook*, *Receiving Antenna Handbook*, *Radioscience Observing*, and *Practical Radio Frequency Test & Measurement*.

But he wasn’t narrowly focused in his interests. He championed young people’s interest in science as a judge in northern Virginia’s numerous science fairs, and, according to fellow publisher Harry Helms, Joe’s own interests were broad, extending into diverse fields of interest like genealogy, world politics, and biomedicine.

Joe passed away at home in his sleep in Annandale, Virginia, November 25, 2000. He was 57. He, too, will be sorely missed.

Bill Orr, W6SAI, of Menlo Park, California, also died in his sleep January 24th at the age of 81. Bill, too, was a prolific author, with a talent for presenting technical topics in an easy-to-understand manner, especially on antenna subjects.

Many of Bill’s titles will be well remembered, including his *Radio Handbook*, *The Beam Antenna Handbook*, *The Quad Antenna Handbook*, *The VHF-UHF Manual*, and *The W6SAI HF Antenna Handbook*.



Photo credit: ARNewsline

Bill was first licensed in 1934, awarded the call sign W2HCE in New York. His W6 call was issued after he moved to California, where he graduated from the University of California during WWII.

Tube-type RF power amplifiers were also a favorite subject of Bill’s, and his application notes for EIMAC tubes were well received by both the professional and amateur community.

The recipient of the 1996 Dayton Hamvention Technical Excellence Award, Bill was a frequent project contributor to virtually every amateur radio magazine. His friendly personality, understandable style of writing, authoritative knowledge of his subjects, and volume of works will long endure. But he, too, will be missed.

The State of the Art Just Took a Giant Step Forward



From monitoring aircraft to public safety, broadcast, shortwave and beyond, the AR 8600 sets new standards in performance. It's no wonder that many monitoring professionals, including government, newsrooms, laboratories, military users and more rely upon AOR.

Introduces the AR 8600

AOR has just raised your expectations of what a wide-range receiver should do. From the ultra-stable TCXO to the availability of Collins® Mechanical Filters and three optional card slots, the AR 8600 blends precision, performance and technical achievement in an attractive, functional package. The AR 8600 is so revolutionary, its design has been awarded US Patent No. 6,002,924!

- Temperature Compensated Crystal Oscillator (TCXO) stable frequency reference
- Covers 530 KHz ~ 2040 MHz*
- Receive Modes: WFM, NFM, SFM, WAM, NAM, USB, LSB, CW
- New front end and RF stages for superior sensitivity
- 2 VFOs (A/B)
- 1000 memory channels (20 banks X 50 memories/bank)
- 40 search banks
- Up to 37 channels/second search rate
- Add up to 3 optional slot cards. Available cards include: Tone Eliminator, CTCSS, Voice Inversion, Recording, External Memory
- Accommodation for Collins® Mechanical Filters
- RS-232C port
- 10.7 MHz IF output (WFM mode only) can be used with SDU 5500 Spectrum Display Unit
- 12 VDC operation
- BNC antenna connection



AOR U.S.A., Inc.

20655 S. Western Ave.

Suite 112 Torrance, CA 90501

310-787-8615 Phone • 310-787-8619 Fax

www.aorusa.com

The world's first VIDEO scanner • Tunes in to everything but cell phones • Wireless video monitor - excellent tool for surveillance

The sky's the limit.

IC-R3

World's First Video Scanner!

Never before has this much excitement been in the palm of your hand. The IC-R3 brings you more than the usual audio you get from an ordinary scanner. Wide tuning range allows you to see and hear the excitement behind the scenes. Large easy to read color display for frequency settings and video reception. All in a compact easy to carry package.

Whether you're a hobbyist wishing to go beyond regular voice communications or a professional who does wireless video security or counter-surveillance - nothing else comes close to the 'R3 in price or versatility. Clearly, the IC-R3 represents a quantum leap in monitoring technology.

There are plenty of video signals out there to monitor.

- 902-928 MHz: Part 15 video equipment; "VCR Rabbits" & wireless security cameras
- 1990-2110 MHz: Auxiliary broadcasting, Cable television, Domestic public fixed.
Heavily used by TV broadcasters for one way transmission services such as: portable van & helicopter mounted transmissions from remote news events; studio-to-transmitter links; and, intercity relay of video programming.
- 2150-2162 MHz: Omni-directional transmission of point to multipoint video signals.
- 2400-2450 MHz: Part 15 video equipment, most notably the Wavecom units

Frequencies courtesy of Scanning USA, Feb. 2001 -Something new to monitor, by Tom Filecco

0.5-2450 MHz* • 450 Memory Channels with Alphanumeric Names • CTCSS with Tone Scan • 4 Level Attenuator • Telescoping Antenna with BNC Connector • Four Way Action Joystick • Lithium Ion Power • and a 2" Color TFT Display with Video/Audio Output.

Limitless uses • The world's first audio scanner/pocket TV combo

*Cellular frequencies blocked; unblocked versions available to FCC approved users.
©2001 ICOM America, Inc. 2380 116th Ave NE, Bellevue, WA 98004 • 425-454-8155. The ICOM logo is a registered trademark of ICOM, Inc. All specifications are subject to change without notice or obligation. R3M1101

See what you've been missing

www.icomamerica.com


ICOM